INSTALLATION AND OPERATING MANUAL

EN

DELPHYS MX Elite+

500 to 600 kVA

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Innovative Power Solutions

CONTENTS

1. CERTIFICATE AND CONDITIONS OF WARRANTY

This SOCOMEC continuous power system is guaranteed against any manufacturing or material defects.

The warranty is valid for 12 (twelve) months from the commission date, provided activation is carried out by SOCOMEC personnel or personnel from a support centre authorised by SOCOMEC, and no more than 15 (fifteen) months from being shipped from SOCOMEC.

The warranty is valid throughout national territory. If the UPS is exported abroad, the warranty will only cover the parts used to repair faults.

The warranty is valid ex-works and covers labour and parts used to repair the faults.

The warranty shall not apply in the following cases:

- Failure due to unforeseen circumstances or force majeure (lightning, floods, etc.);
- Failure due to negligence or improper use (use outside limits: temperature, humidity, ventilation, electric power supply, applied load, batteries);
- Insufficient or inappropriate maintenance;
- When maintenance, repairs or modifications have not carried been out by SOCOMEC personnel, or personnel from a support centre authorised by SOCOMEC.
- If the battery has not been recharged in accordance with the terms indicated on the packaging and in the manual, in the event of long periods of storage or UPS inactivity.

SOCOMEC may, at its own discretion, opt for the repair of the product or the replacement of faulty or defective parts with new parts, or with used parts of equivalent quality to new parts with regard to function and performance.

Defective or faulty parts replaced free of charge must to be made available to SOCOMEC, which becomes the sole owner.

Replacement or repair of parts, or any modifications to the product during the warranty period, will not extend the duration of the warranty.

SOCOMEC will not be responsible for damages under any circumstances (including, without limitations, damage for loss of earnings, interruption of activity, loss of information or other financial losses) arising from the use of the product.

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This document is not a specification. SOCOMEC reserves the right to make any changes to the information provided without prior notice.

2. SAFETY STANDARDS

This user manual specifies installation and maintenance procedures, technical data, and safety instructions for SOCOMEC. For further information visit the Socomec website: www.socomec.com.

	NOTE! Any work carried out on the equipment must be performed by skilled, qualified technicians.
	NOTE! Before carrying out any operations on the unit, please read the installation and operating manual carefully. Keep this manual safe for future reference.
	DANGER! Failure to observe safety standards could result in fatal accidents or serious injury, and damage equipment or the environment.
	CAUTION! If the unit is found to be damaged externally or internally, or any of the accessories are damaged or missing, contact SOCOMEC. Do not operate the unit if it has suffered a violent mechanical shock of any kind.
	NOTE! Install the unit in accordance with clearances in order to allow access to handling devices and guarantee sufficient ventilation (see the section on environmental requirements and handling).
	NOTE! Only use accessories recommended or sold by the manufacturer.
	NOTE! When the equipment is transferred from a cold to a warm place wait approx. two hours before putting the unit into operation.
	NOTE! When carrying out electrical installation, all standards applicable specified by the IEC, in particular IEC 60364, and the electricity supplier must be observed. All national standards applicable to batteries must be observed. For further information, please refer to 'Technical specifications' .
	WARNING! Connect the protective earth (PE) conductor before making any other connections.
	NOTE! The installer is responsible for implementing the backfeed protection with the use of AC input line isolation devices external to the UPS. Refer to the section on electrical installation.
	DANGER! RISK OF ELECTRIC SHOCK! Before carrying out any work on the unit (cleaning and maintenance performances, connection of appliances, etc.), disconnect all power sources.
	DANGER! RISK OF ELECTRIC SHOCK! After disconnecting all power sources, wait approx. 5 minutes for the complete discharge of the unit.
	NOTE! Any use other than the specified purpose will be considered improper. The manufacturer/supplier shall not be held responsible for damage resulting from this. Risk and responsibility lies with the system manager.

NOTE! The product you have chosen is designed for commercial and industrial use only. Products may have to be adapted if used for particular critical applications such as life support systems, medical applications, commercial transportation, nuclear facilities or any other application or system where product failure is likely to cause substantial harm to people or property. For such uses we would advise you to contact SOCOMEC beforehand to confirm the ability of these products to meet the required level of safety, performance, reliability and compliance with applicable laws, regulations and specifications.

	**NOTE!** **This is a product for commercial and industrial application – installation restrictions or additional measures may be needed to prevent disturbances.**
	**WARNING!** **This is a category C3 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.**

Safety requirements for secondary batteries and battery installations.

	**NOTE!** **The installer is responsible for ensuring that the battery installation and their operating environment conform to national and international codes and safety standards.**

2.1. Description of symbols

Symbols	Description
	Protective earth terminal (PE).
	Authorized personnel only. Only qualified personnel are permitted to work on the batteries.
	Do not use naked flames or cause sparks in the vicinity of the accumulators.
	No smoking.
	Batteries charging! Batteries and related parts contain lead which is dangerous to health if ingested. Wash hands after handling!
	Accumulators are heavy! Use suitable transport and lifting equipment to work safely.
	Risk of electric shock! Connecting accumulators in series creates hazardous voltages.
	Risk of explosion! Avoid short circuits! Never place tools or metal objects on the accumulators.
	Corrosive liquids (electrolyte).
	Read the user instructions carefully. Read the user manual before performing any operations.
	Wear protective gloves.

Symbols	Description
	Wear safety shoes.
	Wear protective goggles.
	In the event of accidents, improper use, failure or electrolyte leakage, wear a protective apron.
	In the event of accidents, improper use, failure or electrolyte leakage, wear a gas mask.
	In the event of contact with the eyes, wash immediately with plenty of water and call a doctor. Call a doctor immediately in the event of accidents or illness.
	Do not dispose of in normal waste stream (symbol WEEE).

2.2. Abbreviations

For the purpose of this document, the following abbreviations are used:

BMS	Battery Management System
EMC	Electro Magnetic Compatibility
IEC	International Electrotechnical Commission
LIB	Li-Ion battery
PE	Protective Earth
THDI	Total Harmonic Distortion in Current
THDV	Total Harmonic Distortion in Voltage
UPS	Uninterruptible Power Supply
RCD	Residual current-operated protective devices

3. ENVIRONMENTAL REQUIREMENTS AND HANDLING

	**NOTE!** **Before carrying out any operations on the unit, please read the 'Safety standards' section carefully.**

3.1. Environmental requirements

Premises and location

The proposed location for the UPS should be as follows:

- no obstacles on the floor,
- dry, clean, and dust-free,
- complies with a pollution degree 2 (i.e. free from conductive dust),
- the installation of cables or conduits should be completed,
- the room must be large enough,
- ventilation should be sufficient to ensure a constant temperature to the UPS and to the batteries,
- the site should have a non-flammable floor.

There must be at least 1 m of space in front of the UPS so that the UPS front door can be open smoothly during maintenance and repairs.
Please install the UPS device in a ventilated location. If the UPS device is installed indoors, please consider the heat dissipation characteristics of the device carefully and allow sufficient space around and on top of the UPS device.
Do not place the UPS near heat sources, next to equipments that may generate iron filings or other fine objects, or any location that may generate corrosive substances or steam.
Please ensure the operating temperature and humidity of the environment where the UPS device operates meet the rated requirements of the UPS device. To ensure the reliability of the UPS and the stability of its operating status, and extend the service life of the UPS as much as possible, we recommend that the UPS device should be operated indoors with a temperature of 15 °C to 25 °C and a humidity lower than 80%. Please prevent the UPS device from being exposed to direct sunlight or rain, and avoid direct exposure to strong sand and dust environments.
The floor of the location where the UPS device installed should be able to withstand weights effectively. The UPS device can be fixed to the ground with screws to prevent the UPS device from tilting or moving when earthquakes or other situations occur. When transporting the UPS device, please secure it to the pallet.

	**NOTE!** **The recommended ambient temperature is between 15 °C and 25 °C.**
	**WARNING!** **The Delphys MX Elite+ should only be installed on a concrete surface or other non-combustible surface.**
	**WARNING!** **In case of corrosive or industrial atmospheric environment, please, consult us.**

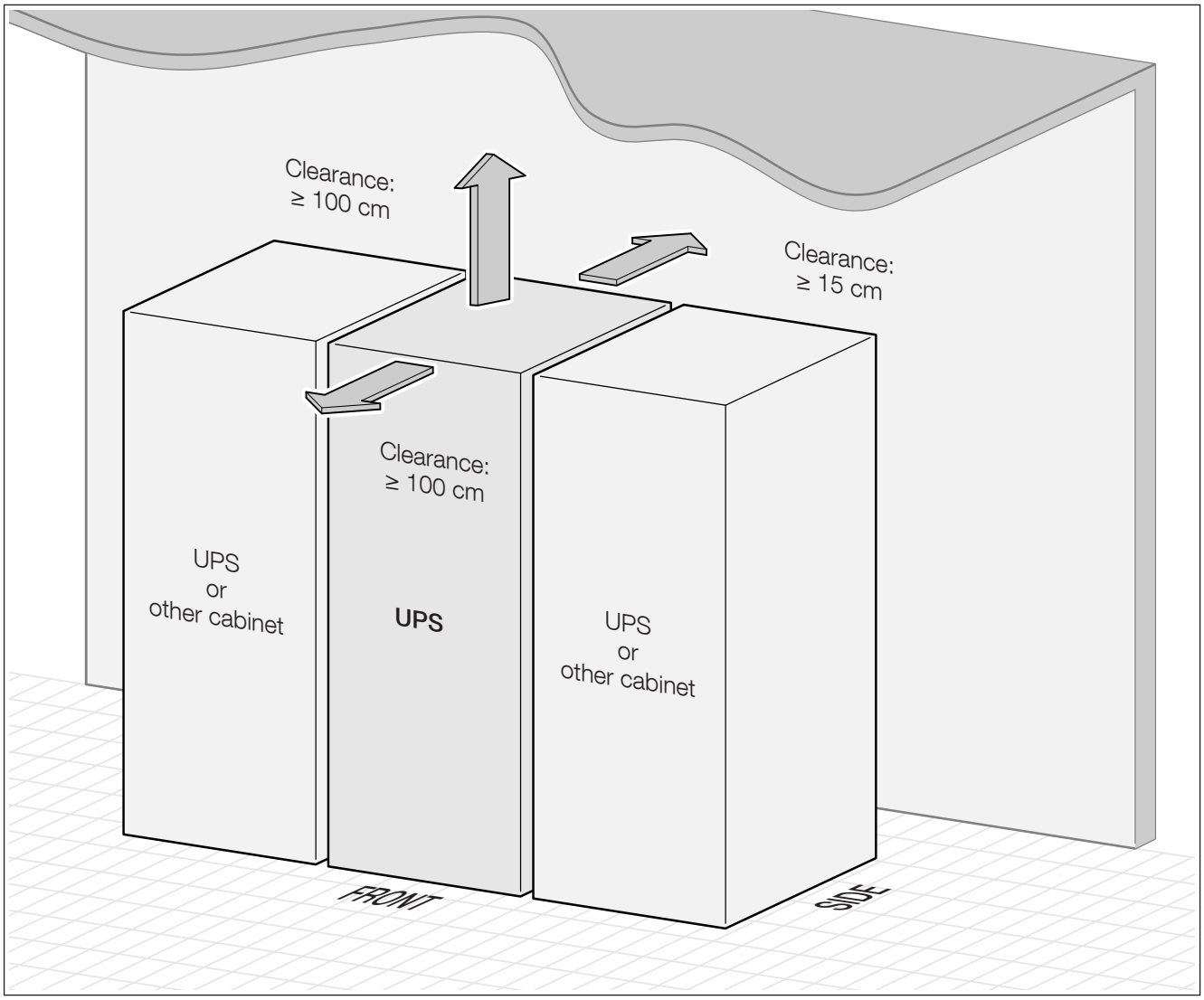
The room must be:

- of a suitable size,
- free from conductive, inflammable, and corrosive items,
- not exposed directly to sunlight,

The floor must support the weight of the unit and guarantee its stability. The unit is designed for indoor installation only.

Room configuration

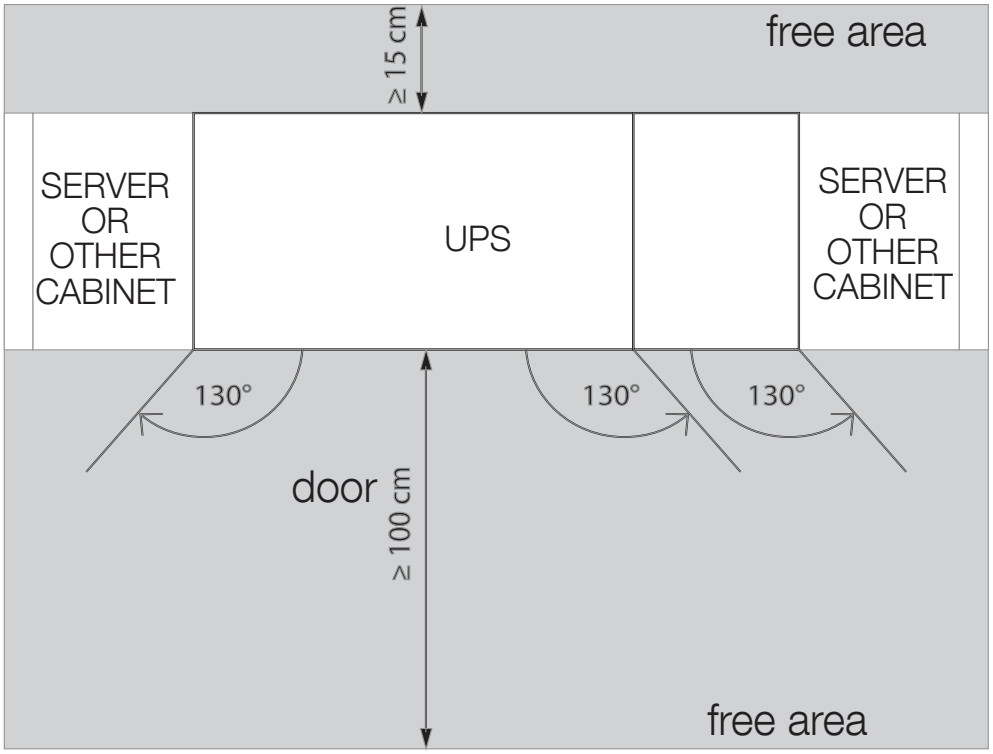
Top view: top air outlet

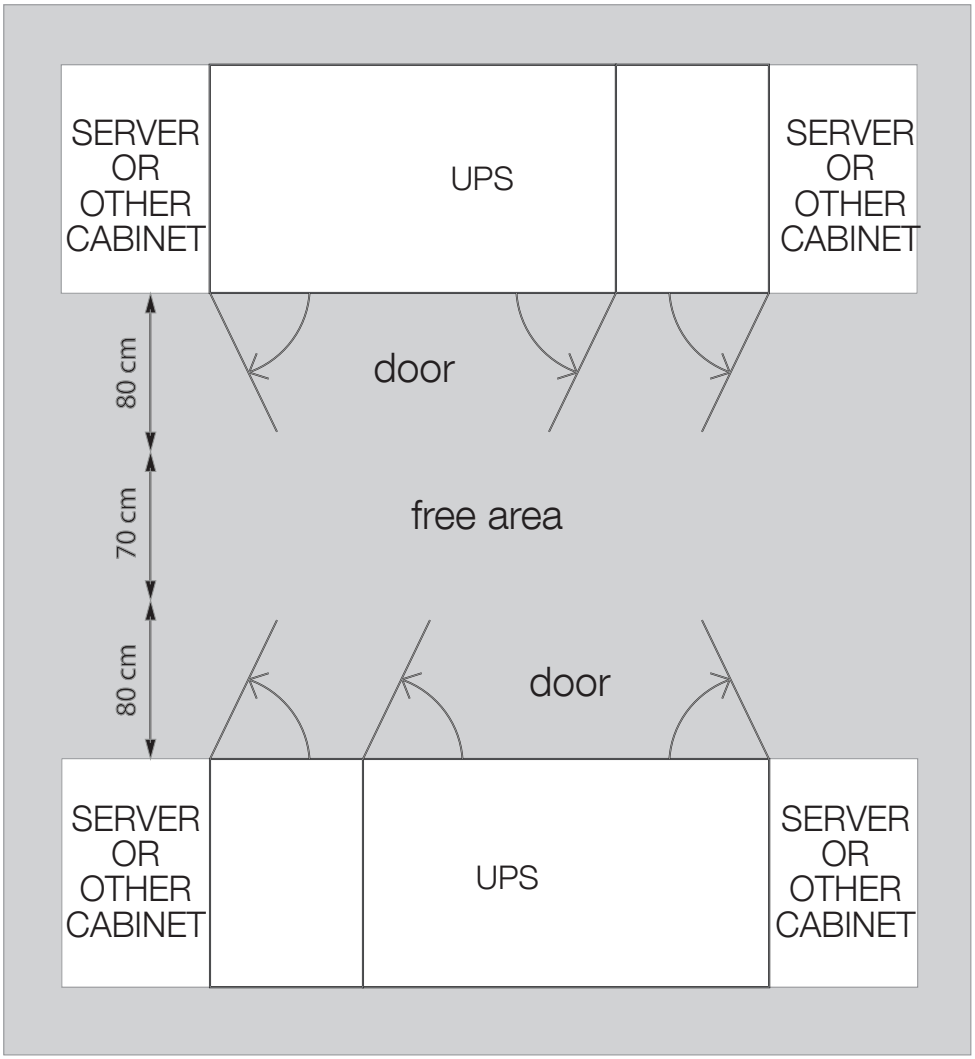


Suggested minimum clearances (at the nominal load and max. ambient temperature).
Contact SOCOMEC if your installation and application conditions are out of the ordinary

In-row configuration

Top view

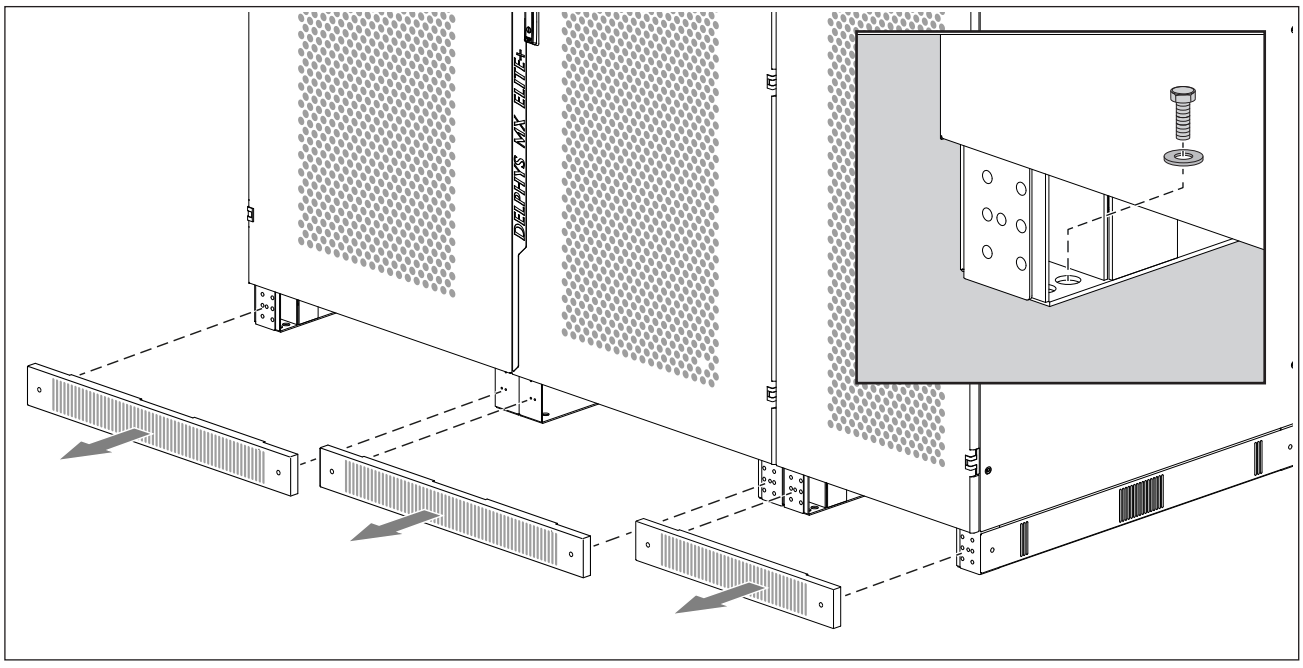




3.2. Handling

- The packaging guarantees the stability of the unit during shipping and physical transfer.
- The unit must remain in a vertical position during all shipping and handling operations.
- Ensure that the floor is strong enough to support the weight of the unit.
- Carry the packaged unit as close as possible to the installation site.

⚠	**WARNING! HEAVY WEIGHT!** **Move the unit using a fork lift truck taking the utmost caution at all times.**
⚠	**WARNING!** **The unit MUST be handled by at least two people; One on each side of the UPS with respect to the direction of movement.**
⚠	**WARNING!** **Do not move the unit by putting pressure on the front door.**
⚠	**WARNING!** **When moving the unit on even slightly sloping surfaces, use the locking equipment and braking devices to ensure that the unit does not fall over.**
⚠	**WARNING!** **The following instructions must be carried out prior to moving the unit (after initial positioning). Failure to heed this warning could result in the unit falling over, equipment damage, injury and even death.**
⚠	**WARNING! RISK OF TIPPING OVER!** **The four feet must be secured evenly to ensure the unit is stable.**
⚠	**NOTE!** **Before carrying out any operations on the unit, please read the 'Safety standards' section carefully.**
⚠	**WARNING! RISK OF TIPPING OVER!** **Before carrying out any operations, ensure the UPS is secured at the feet.**

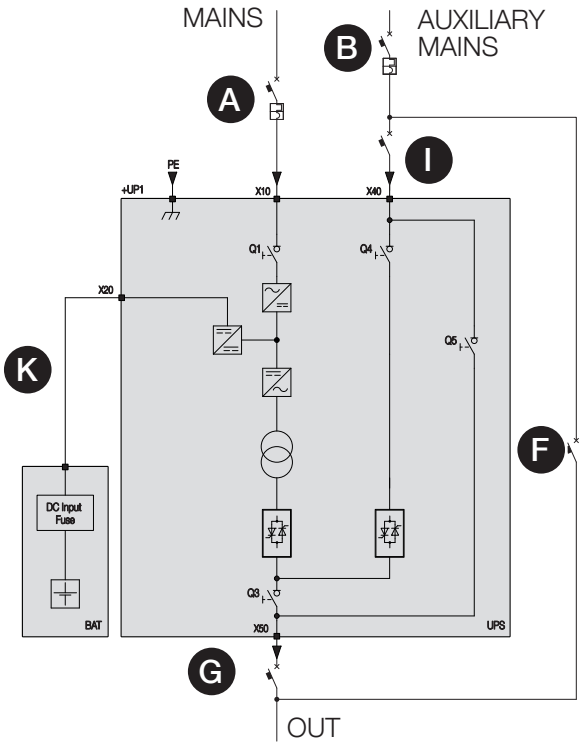


4. ELECTRICAL INSTALLATION

NOTE!
Before carrying out any operations on the unit, please read the 'Safety standards' chapter carefully.

4.1. UPS single configuration

Mains and Auxiliary connected separately



KEY

- **A** — **Input mains thermal-magnetic circuit breaker.**
- **B** — **Auxiliary mains of the thermal-magnetic circuit breaker.**
- **F** — **External maintenance bypass switch.**(1)
- **G** — **External unit output switch.**(2)
- **I** — **External unit Auxiliary mains switch.**
- **J** — **External unit input mains switch.**
- **K** — **External battery switch.**(3)
- **UPS**

(1) To connect a normally-open make contact from the External Maintenance bypass switch to the dedicated connector. See the section "standard features and option".

(2) To connect a normally-open make contact from the External Output switch to the dedicated connector. See the section "standard features and option".

(3) To connect a normally-open make contact from the External Battery switch to the dedicated connector. See the section "standard features and options".

4.2. UPS parallel configuration

4.2.1. General information

A parallel connection enhances UPS system reliability, performance, and power.

Models can be installed in a parallel configuration by specialist personnel using the kit designed for this purpose.

UPS units connected in parallel are fairly similar to a standard UPS unit. As such, the same safety, shipping, and installation recommendations under “Electrical installation” and “Connections" also apply.

UPS units for parallel operation must comply with the distances indicated in the 'Environmental requirements' chapter.

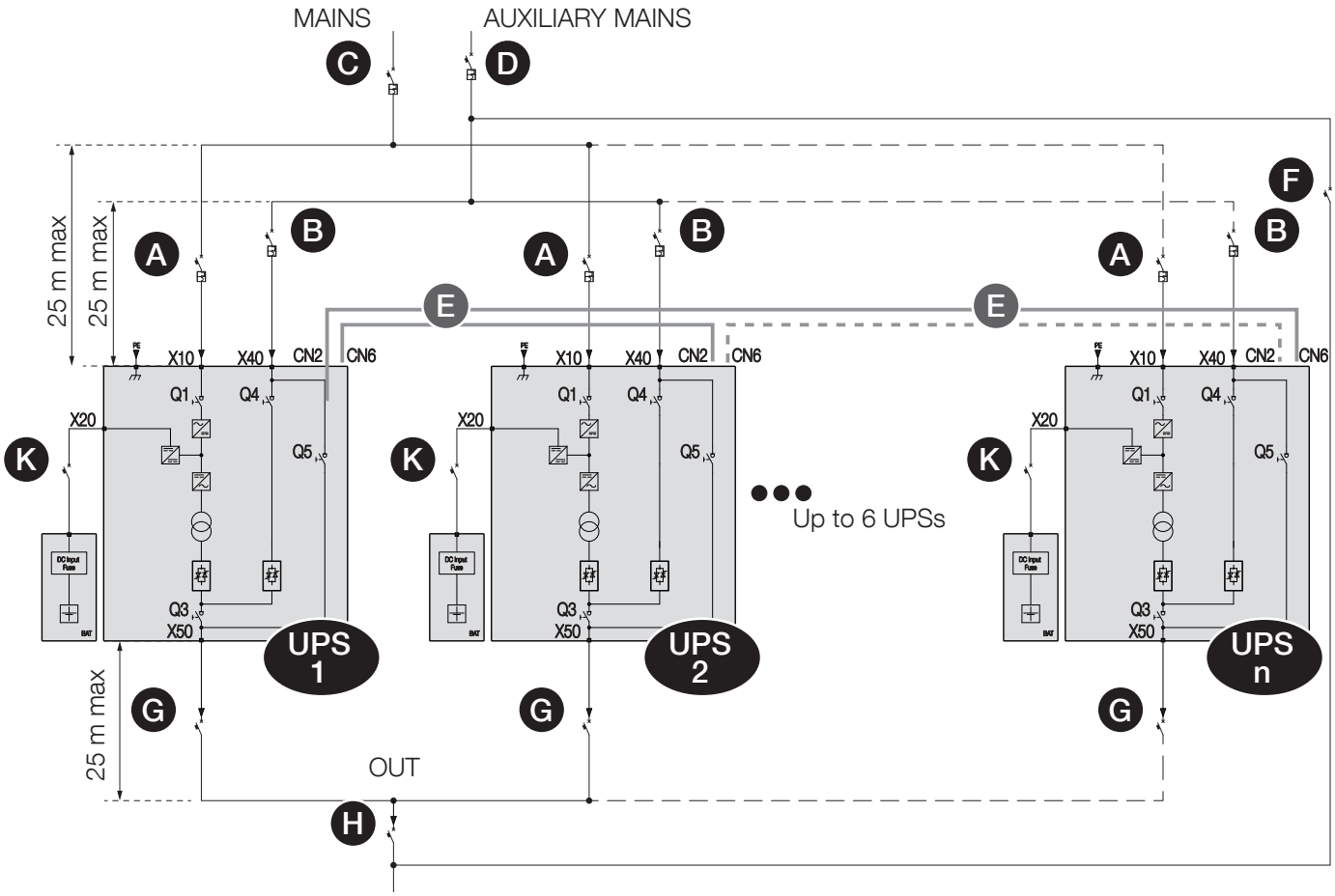
See the section 'Operating procedures' for operating procedures.

4.2.2. Power connections

- See the section 'Electrical requirements' for input protection devices.

	**NOTE!** **The cross-section and length of the input and output cables must be identical for all units.**
	**WARNING!** **The phase rotation must be correct and the same for each unit connected in parallel and also on any external manual bypass line.**
	**NOTE!** **Cables of the same length and cross-section must be used for connection between general power switches (C and D), switches A and B and the respective units.**
	**NOTE!** **If RCD is installed on the mains power switch (optional), it must be selective and inserted upstream of the distribution panel, and the trigger value must be 0.5A multiplied by the number of units connected in parallel (see 'Electrical requirements').**
	**NOTE!** **The cable arrangement for the input, auxiliary, and output lines must the same for each UPS, in order to guarantee the same impedance for each power line.**
	**The system shutdown switch H should always be installed in the external distribution cabinet and recognizable as an emergency shutdown switch (red handle). If this switch is far from the UPS or in another room, a remote shutdown button shall be installed near the UPS.**
	**WARNING!** **Before turning on an individual unit, ensure that the relevant unit output switch G is closed.**
	**WARNING!** **Before opening the unit output switch G ensure that the relevant unit is turned off.**
	**NOTE!** **If the unit has output switches G, we recommend connecting a normally-open early break contact from the switch to the unit’s dedicated connector. See "standard features and options".**
	**NOTE!** **If the unit has an external maintenance bypass switch F we recommend connecting a normally-open early make contact from the switch to the parallel board of the concentrator unit.**

4.2.3. Separate Mains



KEY

- **A** Unit input mains thermal-magnetic circuit breaker.
- **B** Unit Auxiliary mains of the thermal-magnetic circuit breaker.
- **C** Input mains of the thermal-magnetic circuit breaker.
- **D** Auxiliary mains of the thermal-magnetic circuit breaker.
- **E** Parallel bus cable.
- **F** External maintenance bypass switch.(1)
- **G** Unit output switch. (2)
- **H** System shutdown switch.
- **K** External battery switch. (3)

NOTE!
Distributed battery only

(1) To connect a normally-open make contact from the External Maintenance bypass switch to the dedicated connector of each unit. See the section "standard features and option".

(2) To connect a normally-open make contact from the External Output switch to the dedicated connector of each unit. See the section"standard features and option".

(3 To connect a normally-open make contact from the External Battery switch to the dedicated connector of each unit. See the section"standard features and option".

4.2.4. Parallel setup rules

To achieve the best performance in a parallel configuration, ensure that the mains input, output, and auxiliary input cables are as follows:

- the same length (maximum length range is ±5%),
- as short as possible,
- no longer than 25 metres,
- arranged evenly and not wrapped in coils. Cabling must be the same for each UPS in parallel.

WARNING!
In a parallel system, it is necessary to oversize the auxiliary input cables at least 20% more than the rated value, due to the auxiliary input current balance tolerances.

4.2.5. Control connections

Control cables Ⓔ are required for units connected in a parallel configuration.

The control cables are supplied with the UPS in the case of standard parallel arrangements.

Furthermore, every individual unit must read the status of its output switch and the status of the external manual bypass of the system Ⓕ.

Parallel configuration must only be activated by qualified SOCOMEC personnel; in each case arrange the control cables in the relevant cable run as shown in the diagram, leaving the connector(s) unconnected (one incoming and one outgoing control cable must be used).

4.3. Electrical requirements

The installation and system must comply with national plant regulations. The electrical distribution panel must have a sectioning and protection system installed for input and auxiliary mains. An RCD is not necessary when the UPS is installed in a TN-S system. An RCD is not allowed on TN-C systems. If an RCD is required, a B-type should be used.

SYSTEM CABLE - MAX SELECTION				
		Holes per bar	500 kVA	600 kVA
Rectifiers terminals	Flexible	3	3 cables for each bar x 240 mm² - M12	
	Rigid			
Bypass terminals(1)	Flexible	4	3 cables for each bar x 240 mm² - M12	
	Rigid			
Battery terminals	Flexible	2	4 cables for each bar x 240 mm² - M12	
	Rigid			
Output terminals(1)	Flexible	4	3 cables for each bar x 240 mm² - M12	
	Rigid			

Tightening torque 46 Nm

Max. section is determined by the size of the terminals.

(1) Neutral conductor must not be smaller than the phase conductor.

RECOMMENDED PROTECTION DEVICES - Rectifier (A)			
Power (kVA)		500	600
C Curve circuit breaker	(A)	1250	1250
Differential input(1)	(A)	> 1	

Circuit breaker switch recommended with magnetic intervention threshold ≥ 10 In (curve C). It is necessary to use a D curve selective breaker if an optional external transformer is used.

(1) Caution! A Residual Current Detection (RCD) device can only be used with a common input and auxiliary mains (configuration not recommended). It must be placed upstream of the connection between input mains and auxiliary mains. Use type B 4-pin selective (S) residual current detectors. Load leakage currents are to be added to those generated by the UPS and during transitory phases (power failures and power returns) short current peaks may occur. If loads with high leakage current are present, adjust the residual current protection. It is advisable in all cases to carry out a preliminary check on the earth current leakage with the UPS installed and operational with the definitive load, so as to prevent the RCD tipping over.

RECOMMENDED PROTECTION DEVICES - Auxiliary mains (B)			
Power (kVA)		500	600
C Curve circuit breaker	(A)	1250	1250

Circuit breaker switch recommended with magnetic intervention threshold ≥10 In (curve C). It is necessary to use a D curve selective breaker if an optional external transformer is used.

The short-time withstand current (Icw) according to IEC 62040-1 is 20 kA rms for 500 kVA system, 35 kA rms for 600 kVA system.
Contact Socomec for detailed information.

	**NOTE!** **To ensure the integrity of the bypass:** **I^2t must be lower than 1125 kA^2s and peak current must be lower than 15 kA.** **Contact SOCOMEC for detailed information.**
	**WARNING!** **The UPS is designed for transient overvoltages in Cat III installations.**
	**WARNING!** **The protective earthing conductor (PE) must have sufficient current-carrying capacity. The PE cable core size must be chosen according to the PROTECTIVE CURRENT RATING of the ground circuit which depends on the provision and location of protective overcurrent devices.**
	**NOTE!** **3-Phase 3-Wire input power is required. The unit can be installed in TN, TT AC distribution systems (IEC 60364-3).**
	**NOTE!** **Use an internal isolation transformer. Neutral arrangements downstream of the UPS may be necessary.**

Backfeed protection

The UPS is set up for the installation of external protection devices contactor against the backfeed of dangerous voltages on the aux input mains power supply line (AUX MAINS SUPPLY). The current rating of the switching device must follow the instructions outlined in the section'electrical installation'. To activate the backfeed protection, select "BACKFEED PROT. ENABLE" on Setting>Advance>INV2 menu and see the section 'Dry contacts interface'.

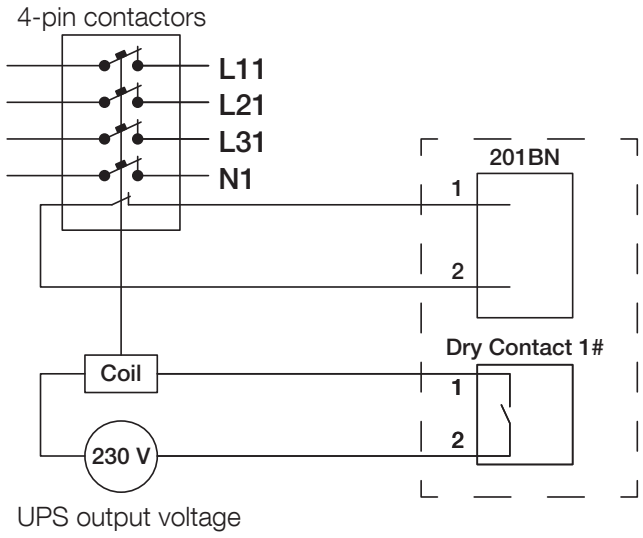
DANGER! RISK OF ELECTRIC SHOCK!
The installer must attach the warning label to warn electrical technicians about dangerous backfeed situations (not caused by the UPS).

Warning label (supplied with the equipment)

Before working on this circuit
- Isolate the Uninterruptible Power System (UPS)
- Then check for Hazardous Voltage between all terminals including the protective earth

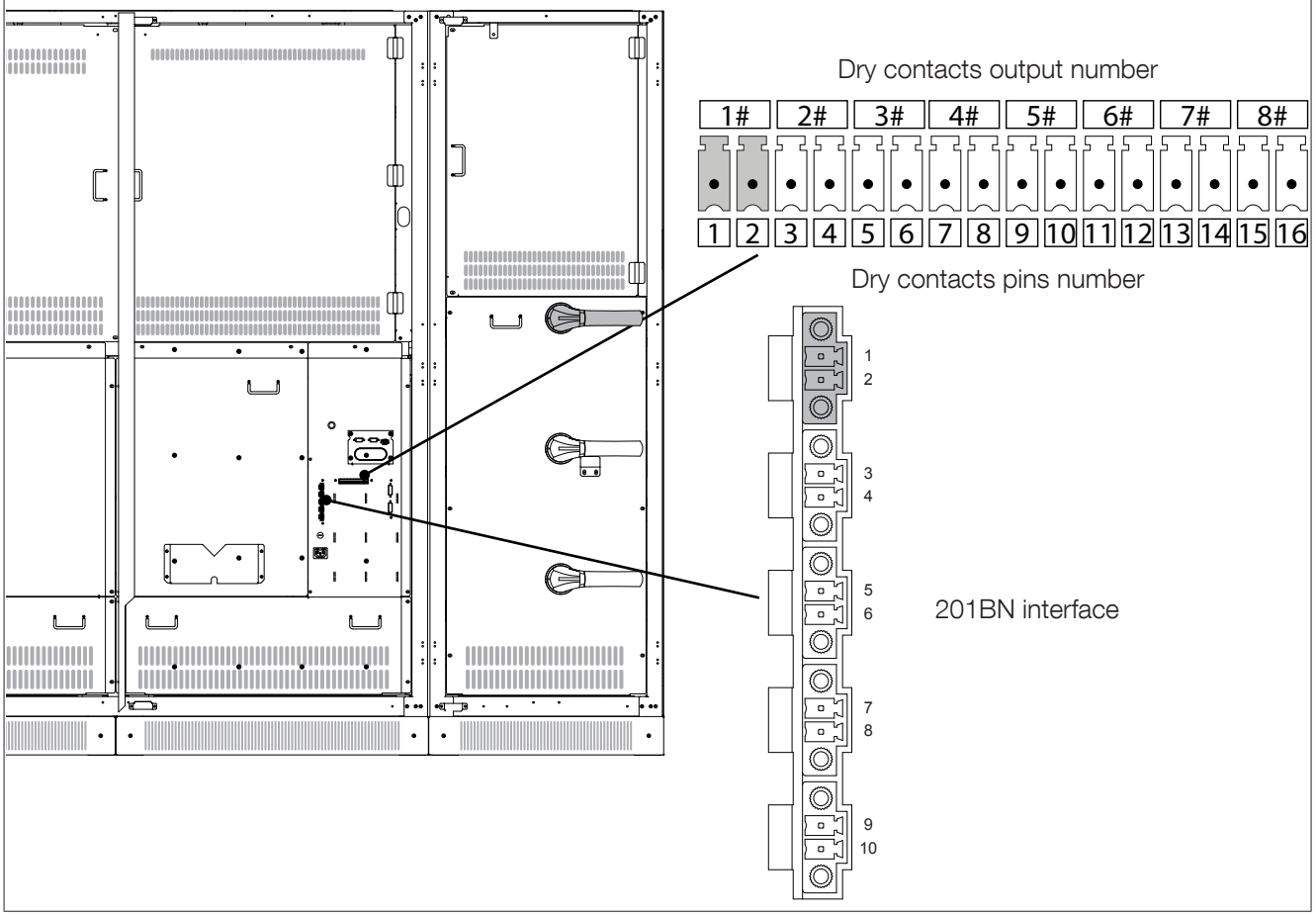
Risk of Voltage Backfeed

Backfeed electrical diagram



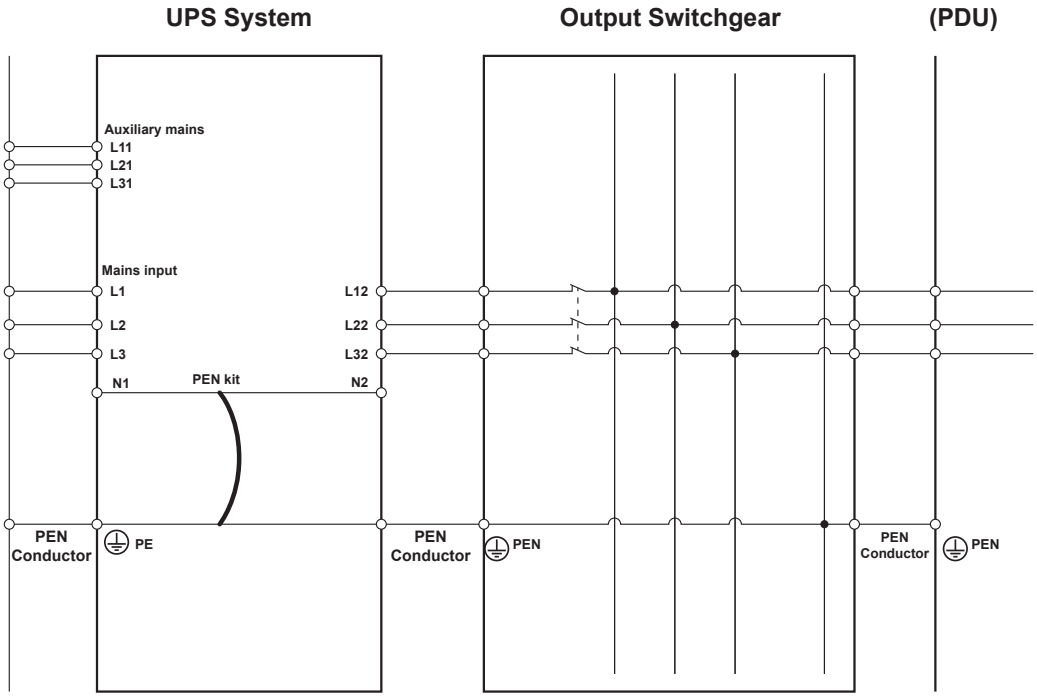
NOTE!
Use a 4-pin contactors (normally-closed) with 220-240 V release coil and auxiliary detecting signals (normally close).

Backfeed connector



4.4. TN-C Distribution system

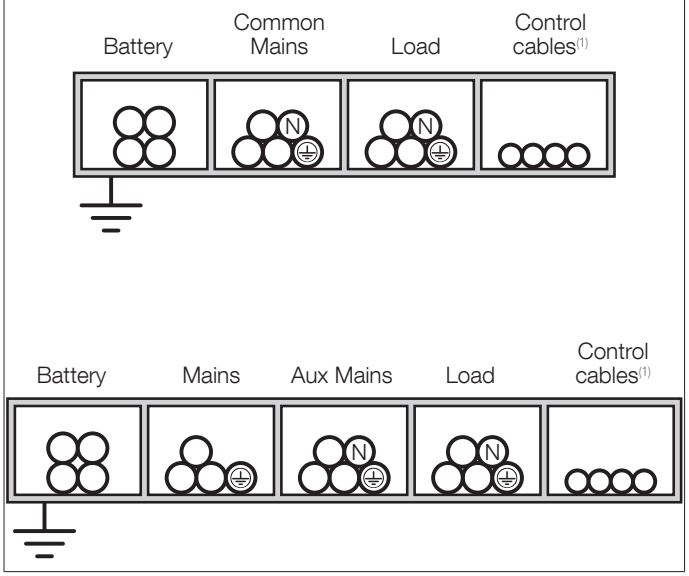
A PEN Kit is available for the TN-C distribution system



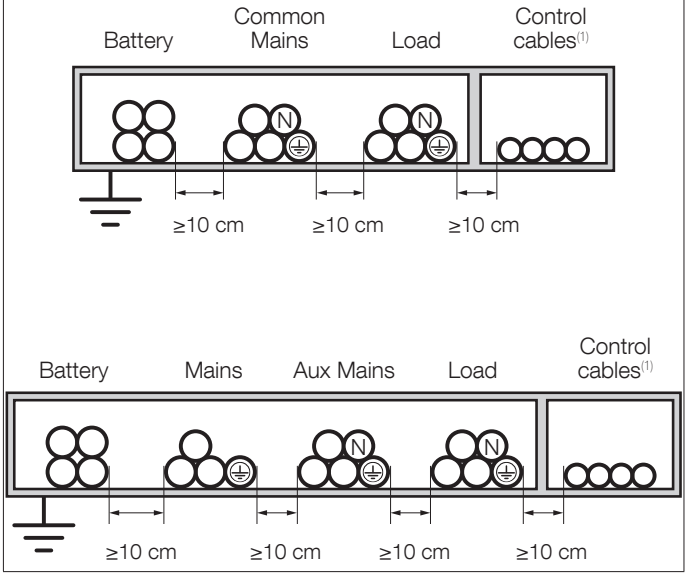
4.5. Cable positioning

⚠	**WARNING!** **The cables must be installed on trays according to the following diagrams. The trays must be positioned near the UPS.**
⚠	**WARNING!** **All metal and suspended ducts or those in raised flooring MUST be grounded and connected to the various cabinets.**
⚠	**WARNING!** **Power cables and control cables MUST NEVER be installed in the same duct.**
⚠	**WARNING!** **Risk of electromagnetic interference between battery cables and output cables.**

Correct installation



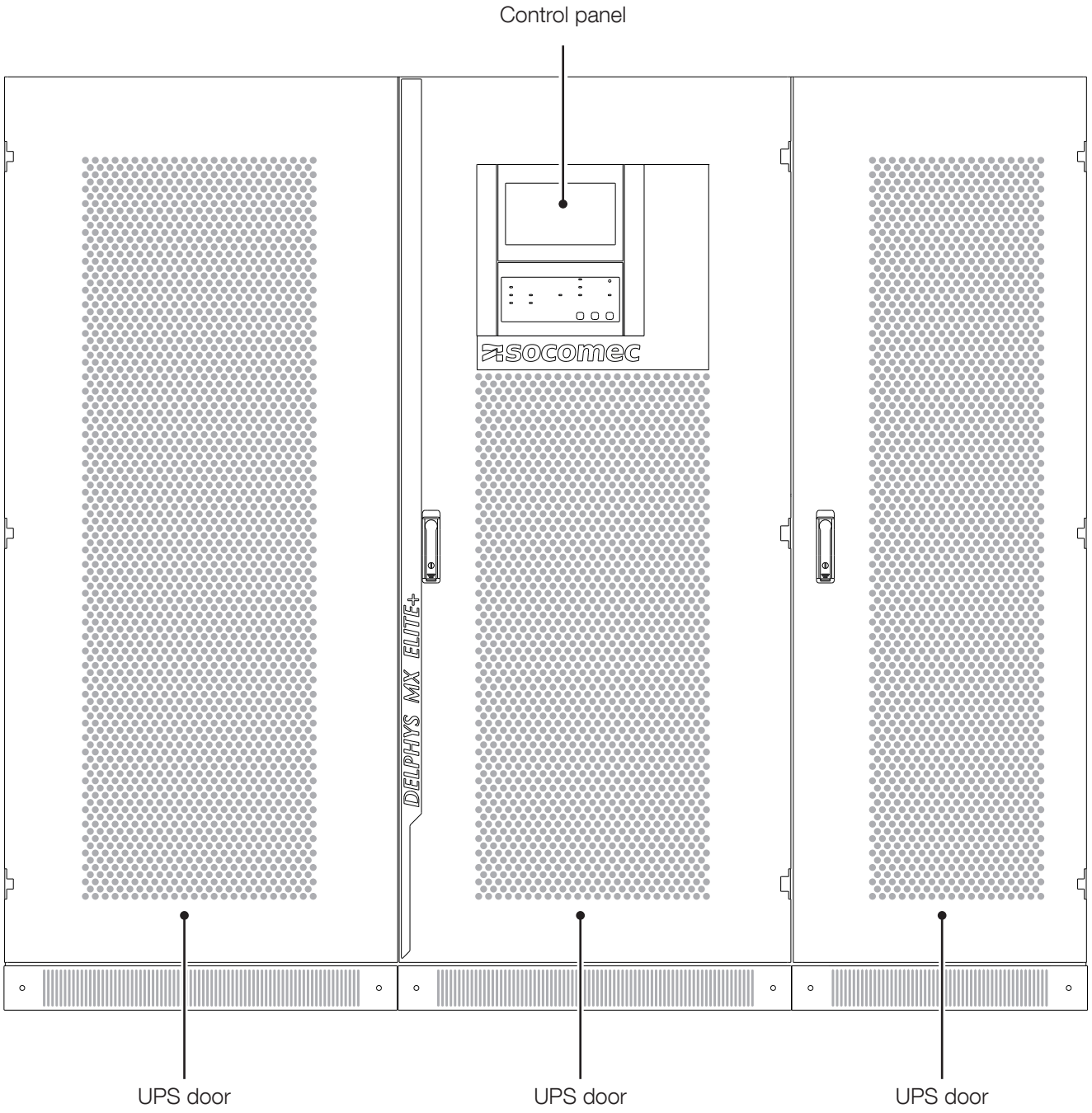
Acceptable installation

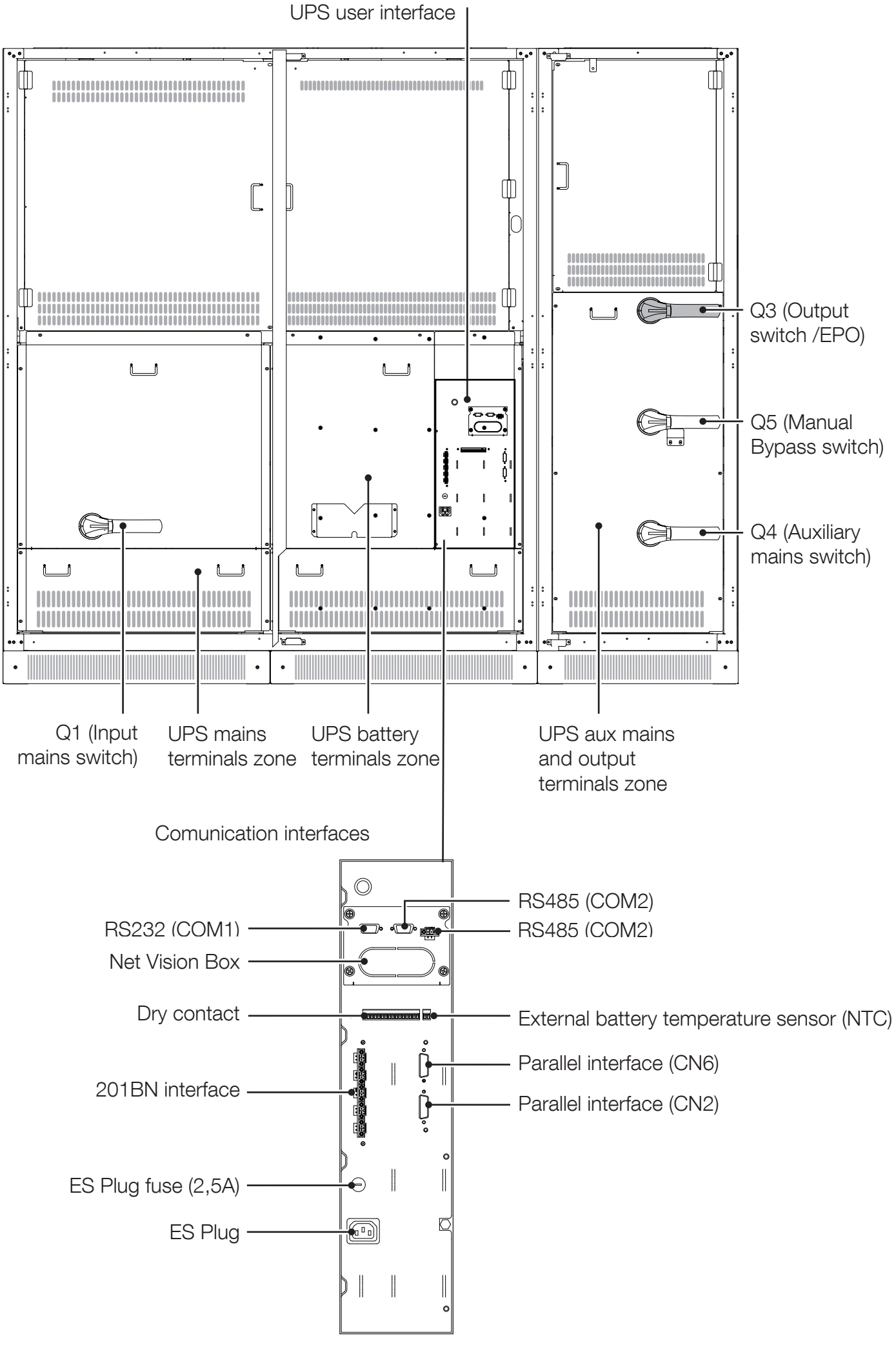


(1) Control cables: connections between the cabinets and each unit, alarm signals, UPO, etc.

5. OVERVIEW

DELPHYS MX Elite+ front view



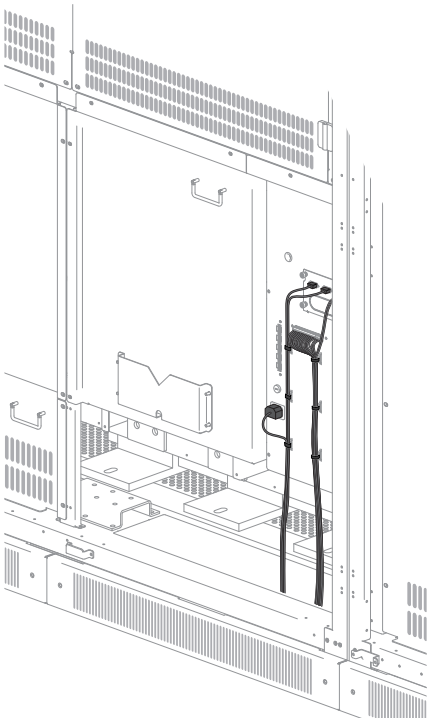

UPS user interface
Q3 (Output switch /EPO)
Q5 (Manual Bypass switch)
Q4 (Auxiliary mains switch)
Q1 (Input mains switch)
UPS mains terminals zone
UPS battery terminals zone
UPS aux mains and output terminals zone
Comunication interfaces
RS485 (COM2)
RS232 (COM1)
RS485 (COM2)
Net Vision Box
Dry contact
External battery temperature sensor (NTC)
Parallel interface (CN6)
201BN interface
Parallel interface (CN2)
ES Plug fuse (2,5A)
ES Plug

6. CONNECTIONS

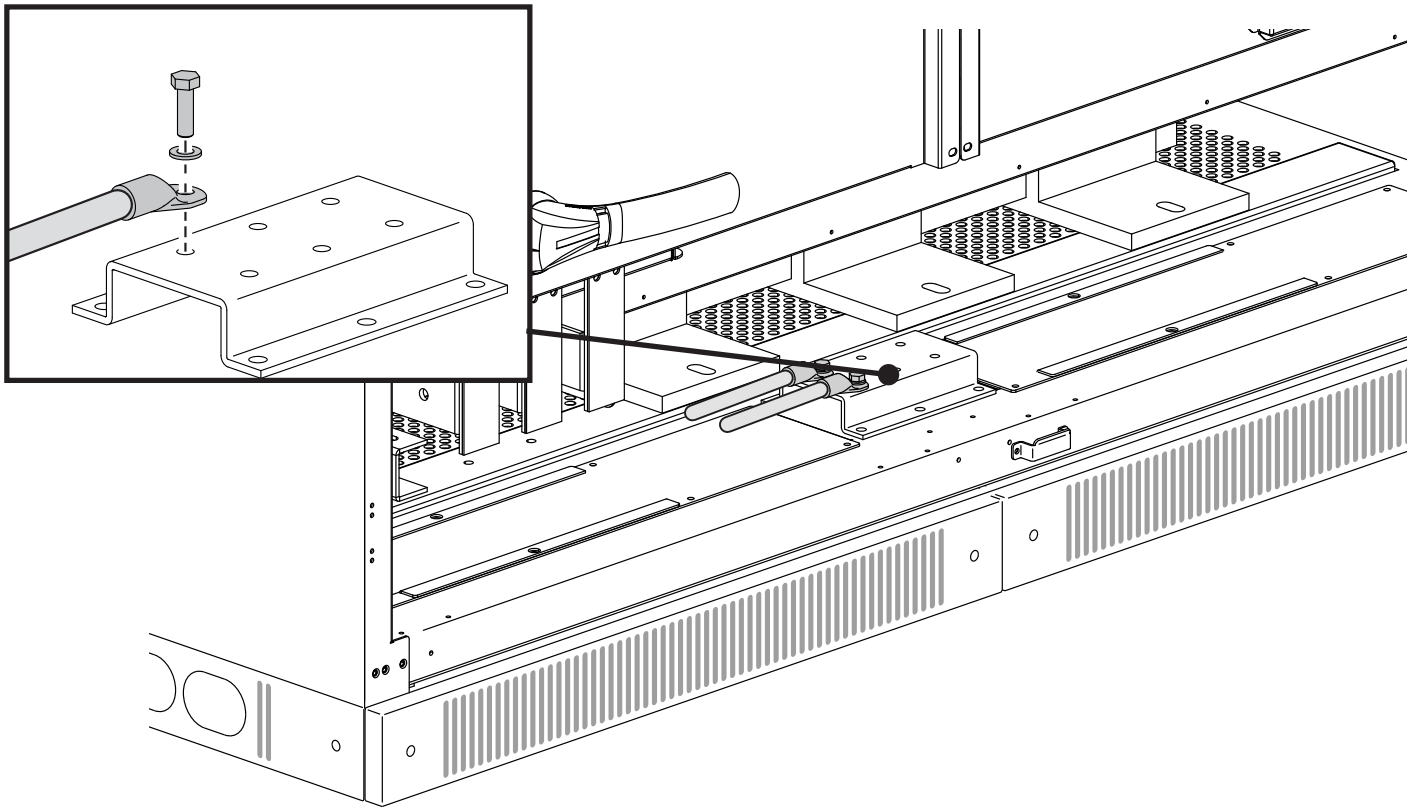
⚠	NOTE! Before carrying out any operations on the unit, please read the section 'Safety standards' carefully.

⚠	WARNING! The minimum size of the Protective earthing conductor (PE) shall comply with the local safety regulations for high PE conductor current equipment.

6.1. Communication interfaces cabling



6.2. Protective earth (PE) cabling

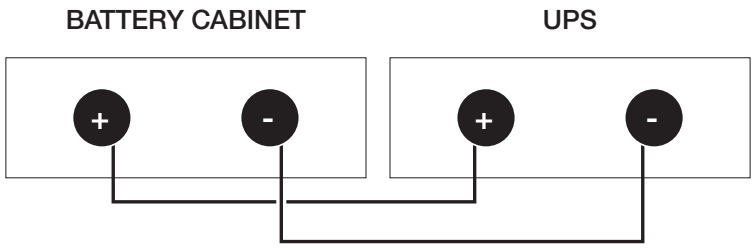


6.3. External battery connection

⚠	NOTE! For further information, refer to the battery cabinet manual.

- Remove the plastic terminal block protection.
- Connect the protective earth (PE) cable.
- Connect the cables between the UPS terminals and the battery cabinet terminals.

⚠	WARNING! Strictly observe: • the polarity of each individual string (refer to the figure below), • the cable cross section (refer to 'UPS single configuration' chapter).
⚠	WARNING! Cabling errors with inversed battery polarity may cause permanent damage to the equipment.
⚠	NOTE! Reassemble the plastic terminal block protection.



⚠	NOTE! When battery cabinets not supplied by Socomec are used, the installer is responsible for: • checking electrical compatibility, • checking the presence of appropriate protective devices (fuses and switches that ensure the cables are protected from the UPS to the battery cabinet). Once the UPS is switched on – before closing the battery switches – check the battery parameters on the control panel menu. For further information, refer to the section 'Display operation'.
⚠	NOTE! Not all battery/capacity combinations are available.

6.3.1. Battery cabling

WARNING!

Battery power terminals can be supplied by:

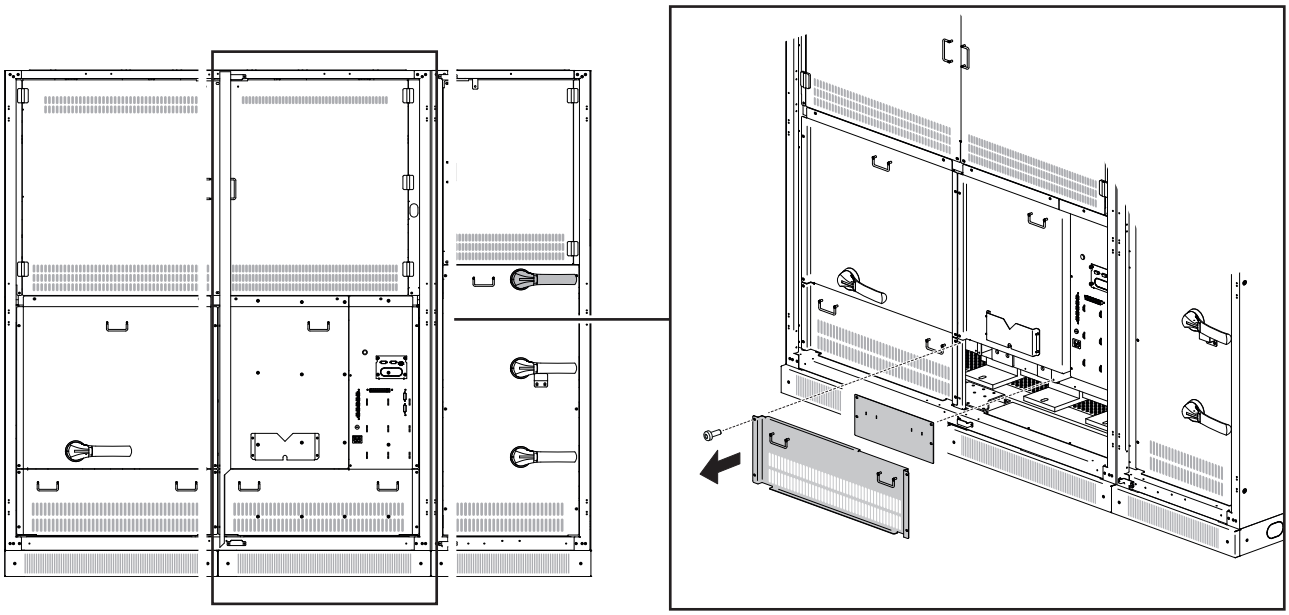
- an external battery cabinet,

Before working on this circuit ensure that:

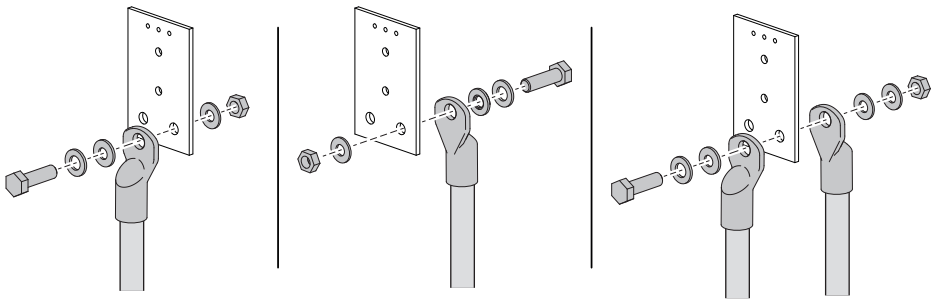
- all the external battery cabinet switches are in OFF position,
- the UPS is in maintenance bypass mode (refer to the section 'Operating modes');

Check the absence of voltage before carrying out any operation.

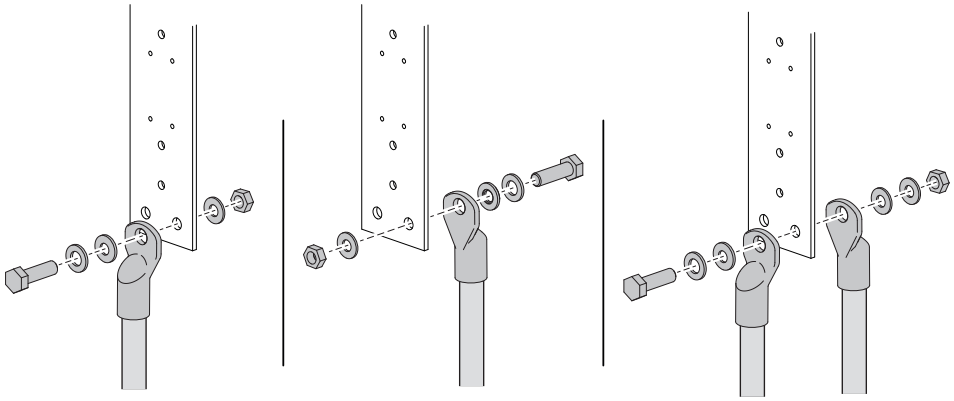
1 Removing front panel protection

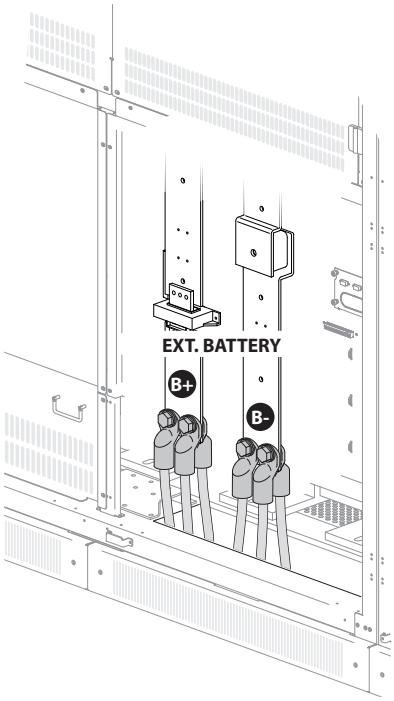


1



2

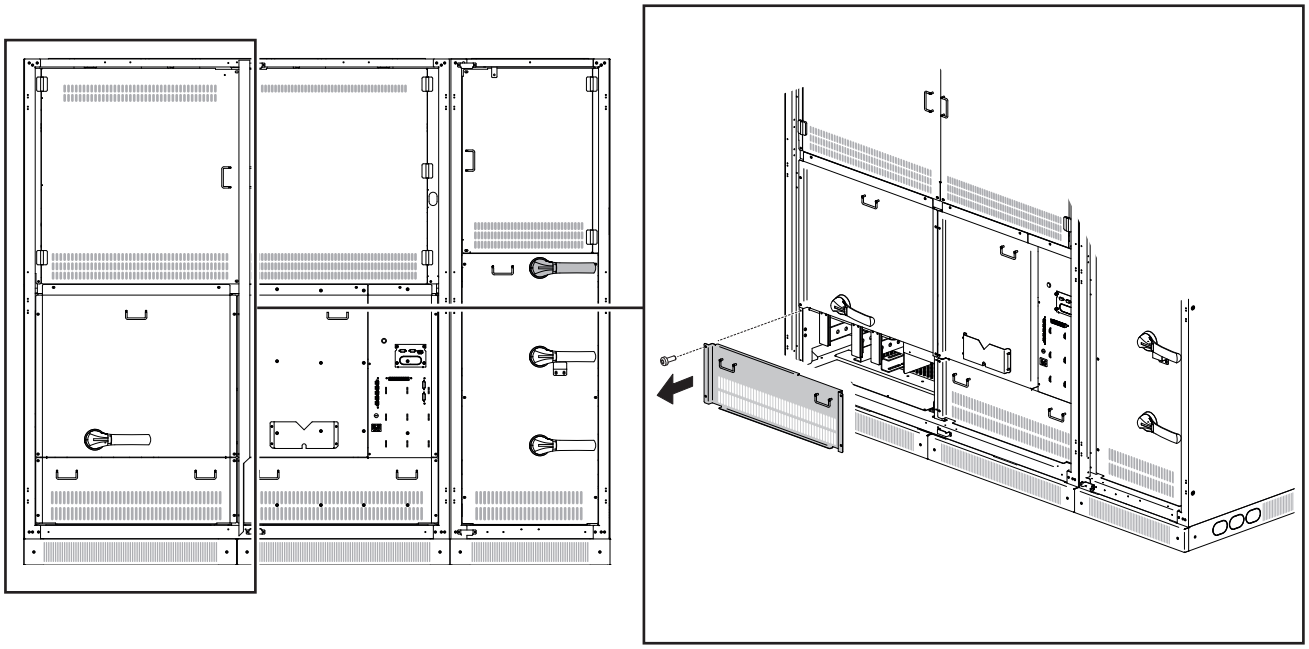


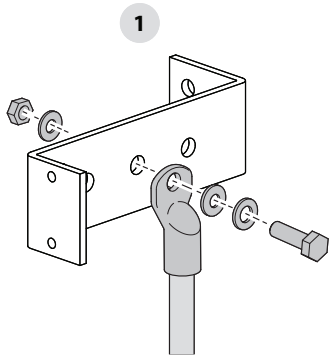


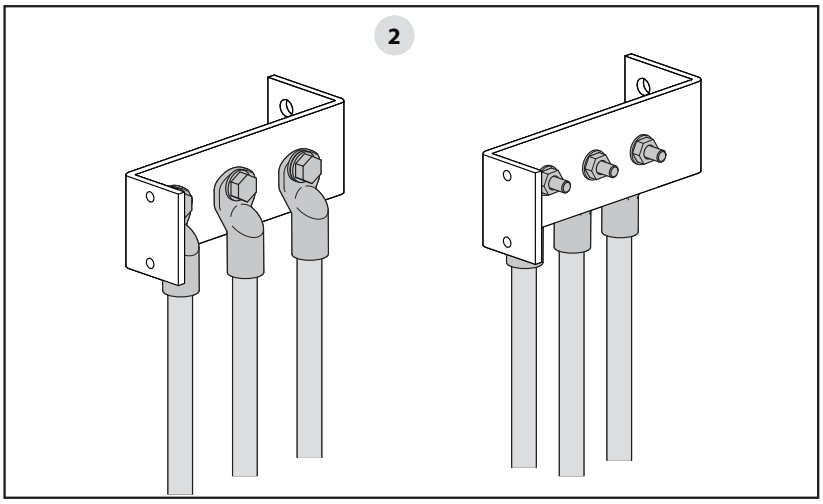
6.4. Mains and auxiliary mains connected separately

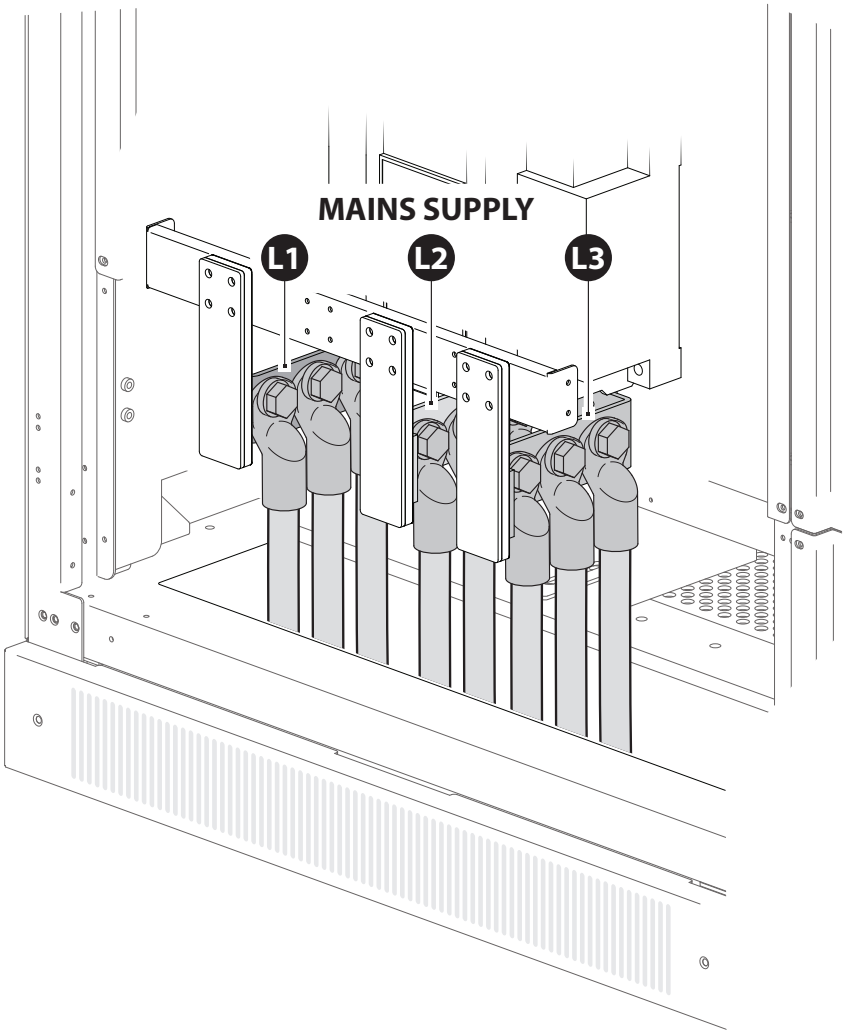
6.4.1. Mains supply cabling

1 Removing front panel protection



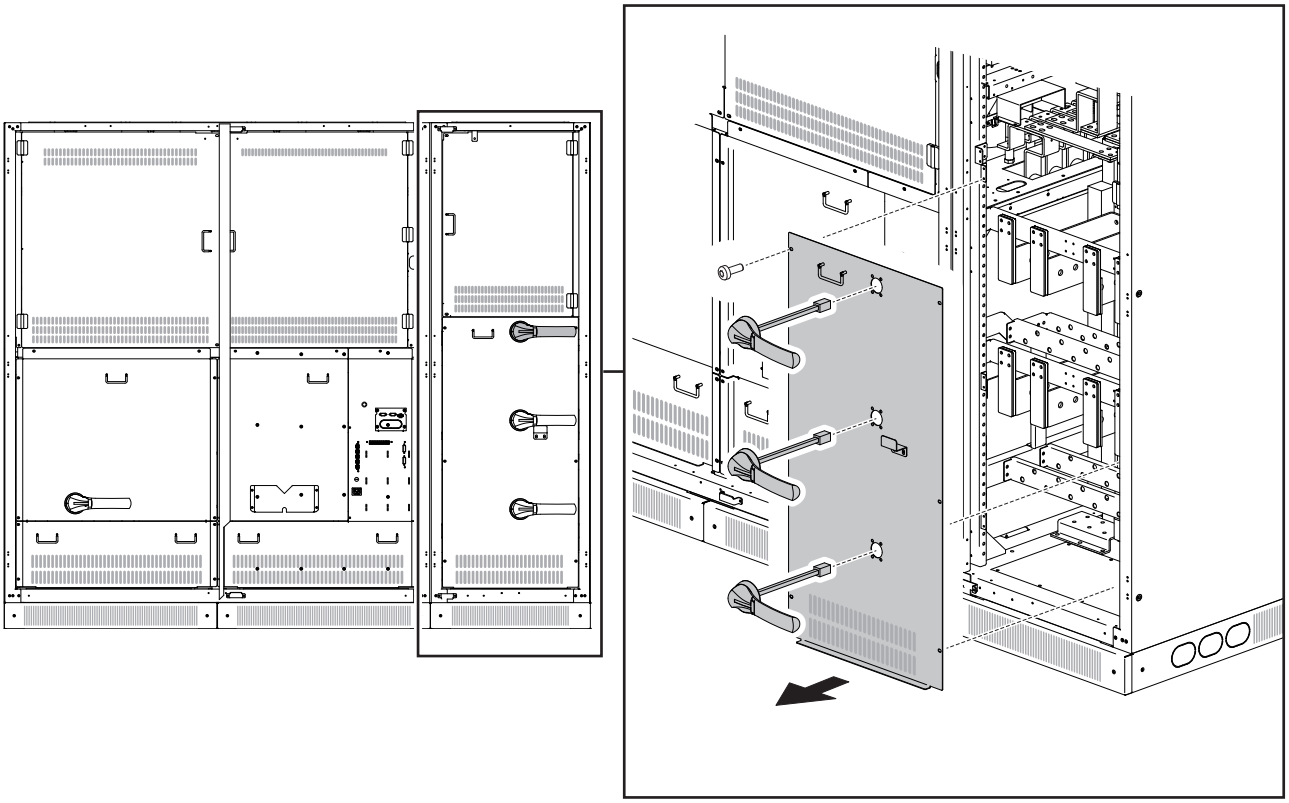

1


2

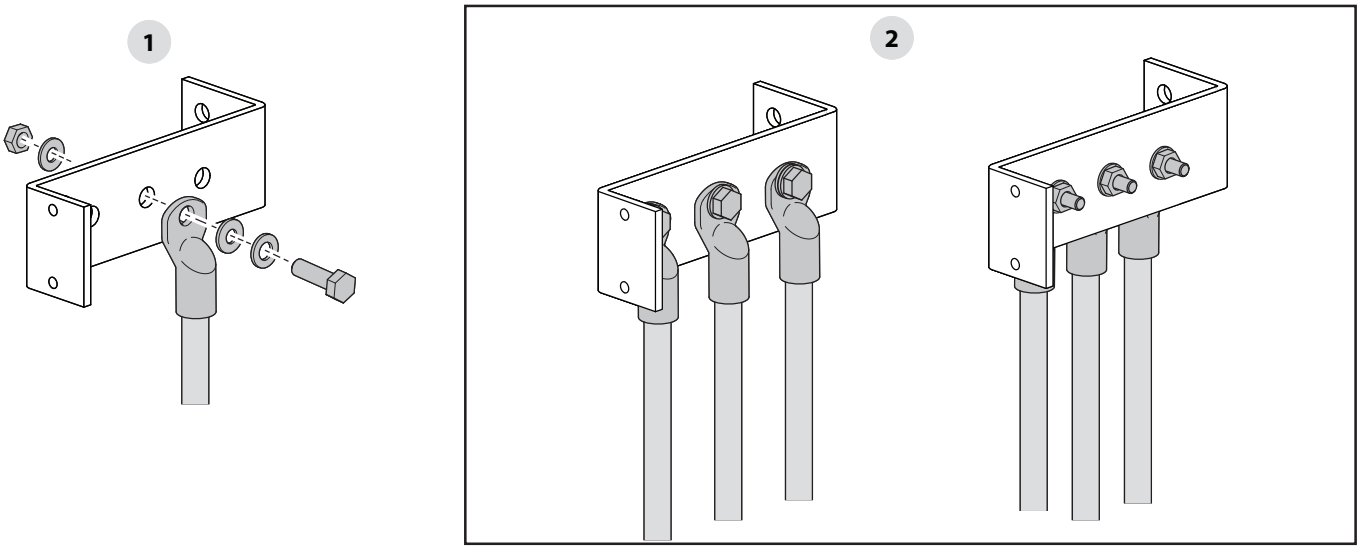

MAINS SUPPLY
L1
L2
L3

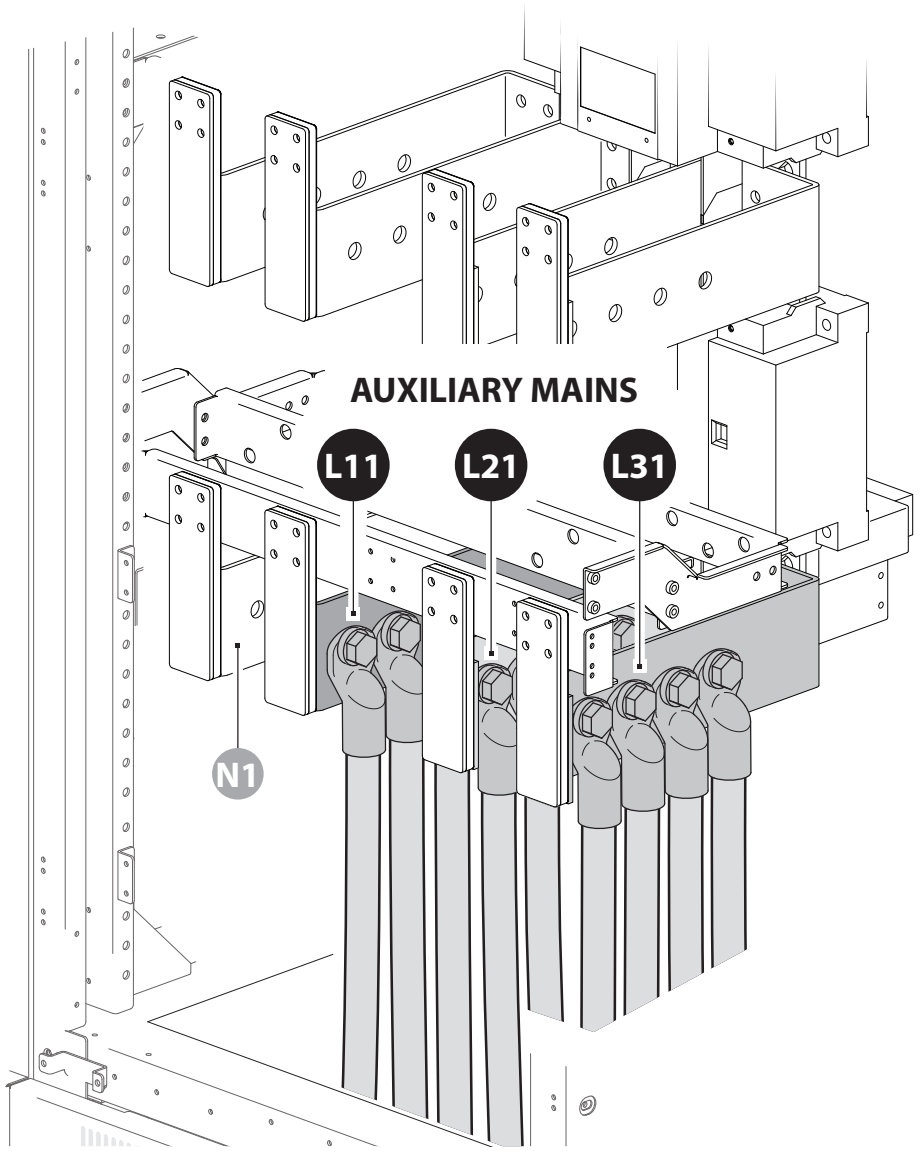
6.4.2. Aux mains and Output supply cabling

1 Removing front panel protection

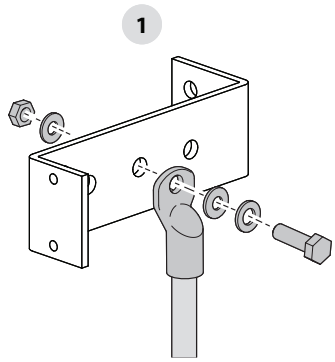


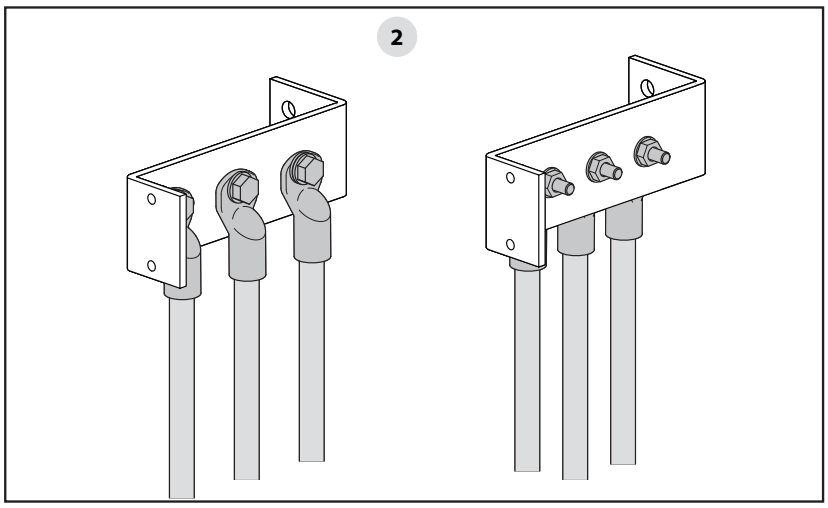
2 Aux mains supply cabling

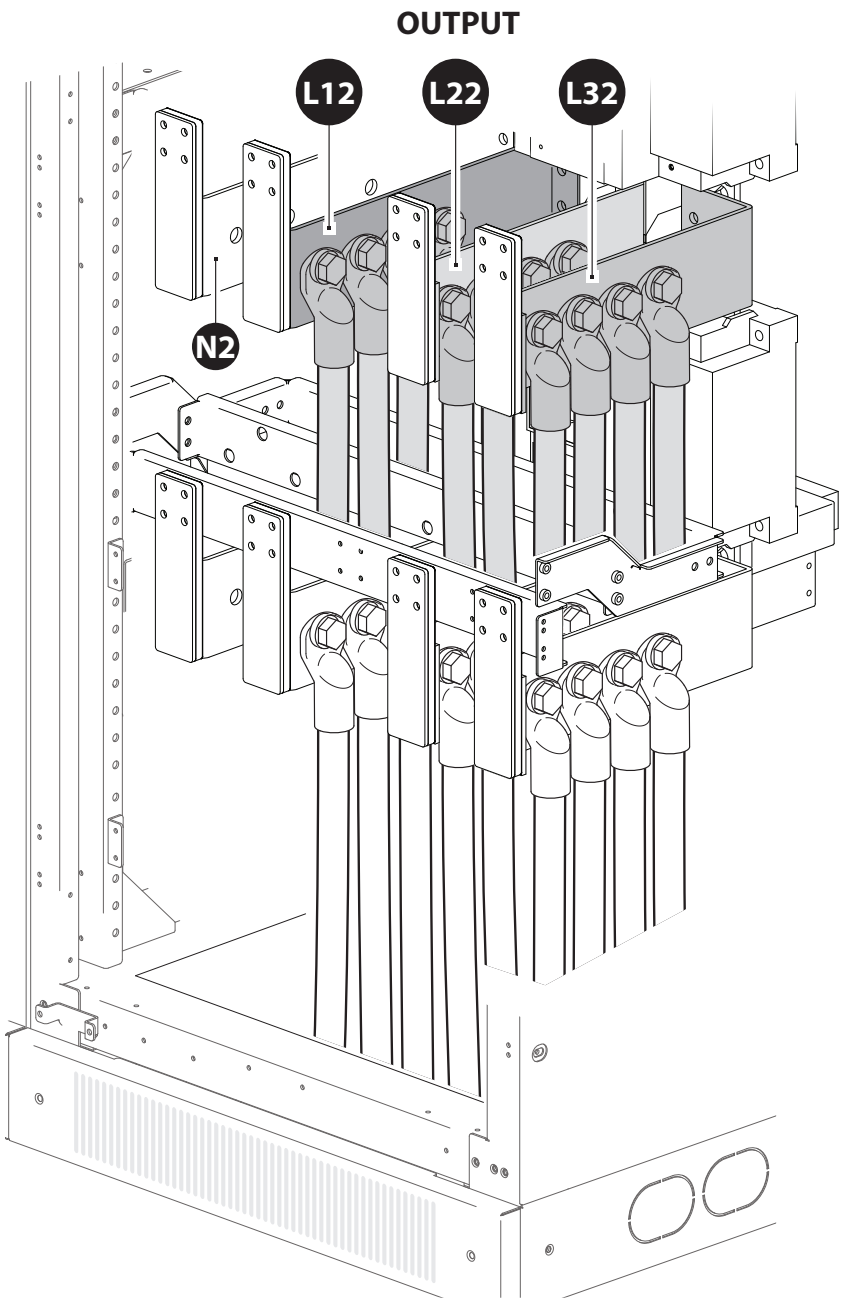




WARNING!
Use cable ties to secure the cables.



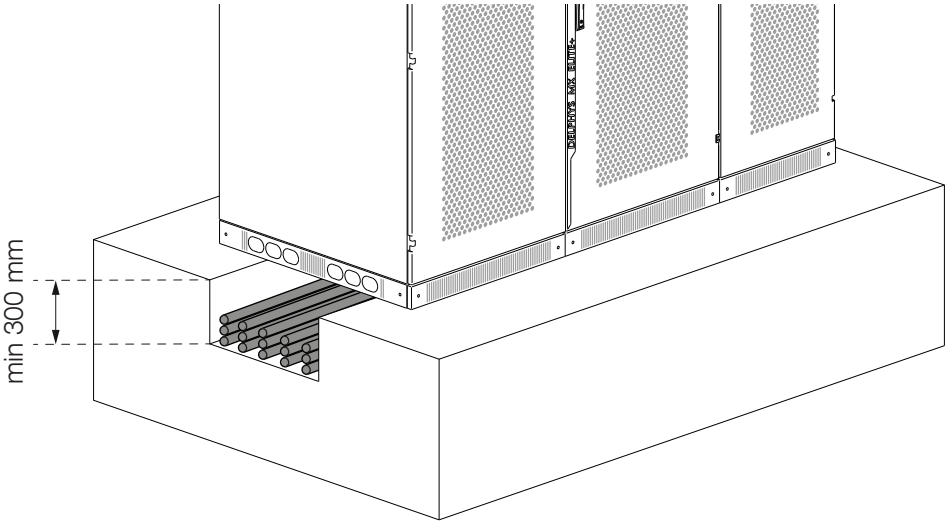


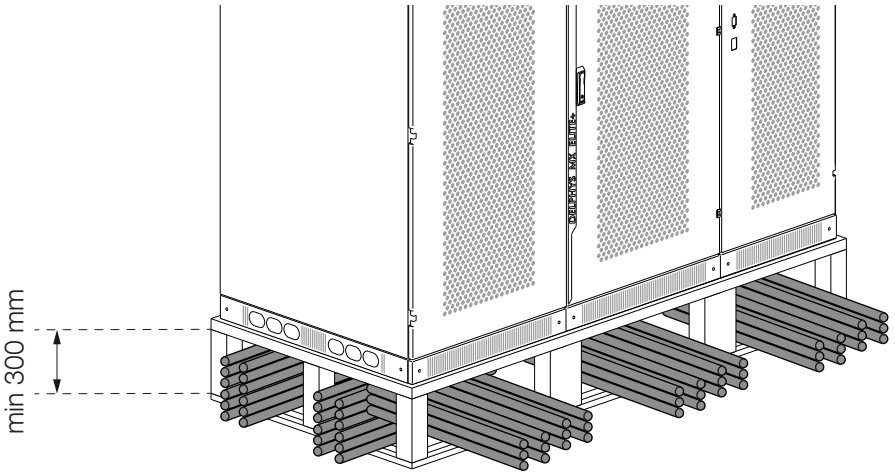


WARNING!
Use cable ties to secure the cables.

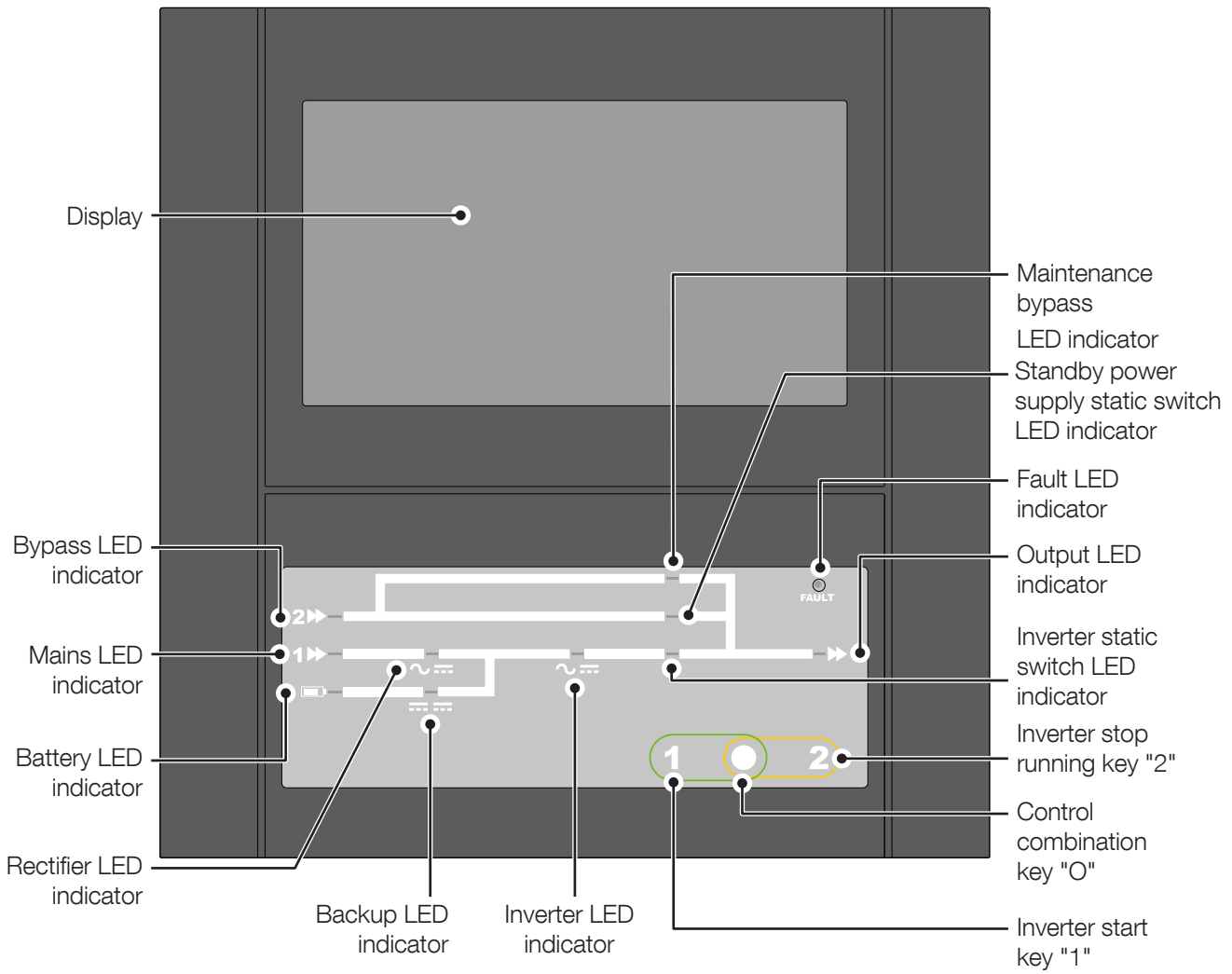
6.5. Cabling requirements

⚠	NOTE! Before carrying out any operations on the unit, please read the 'Safety standards' section carefully.
⚠	WARNING! RISK OF TIPPING OVER! Before carrying out any operations, ensure the UPS is secured at the feet.
⚠	WARNING! RISK OF TIPPING OVER! The four feet must be secured evenly to ensure the unit is stable.





7. CONTROL PANEL



• Display: the main active matrix of the display is sensitive to touch pressure. The display is designed for heavy-duty industrial applications. The display is single touch only (no double touch effects). Depending on the touch pressure, the navigation tree and various functions are activated. For power consumption and to extend service life, after 10 minutes the display backlight turns off.

• the battery LED indicator is ON when the DC input switch is closed,

• the mains LED indicator is ON when the rectifier input switch is closed,

• the bypass LED indicator is ON when the bypass input switch is closed,

• the backup LED indicator is ON when the UPS is in backup mode,

• the rectifier LED indicator is ON when the rectifier starts to work,

• the inverter LED indicator is ON when the inverter starts to work,

• the standby power supply static switch LED indicator is ON when the standby power supply static switch is closed. The standby power supply static switch and the inverter static switch will not turn on simultaneously, and so the inverter static switch LED indicator and the backup power supply static switch LED indicator will not light up simultaneously,

• maintenance bypass LED indicator: this indicator is ON when the manual maintenance bypass switch is closed. When the manual maintenance bypass switch is closed, the inverter is unable to start; if the inverter is running at the time, it will stop working immediately,

• inverter static switch LED indicator: this indicator is ON when the inverter static switch is turned on and the static bypass switch stops conducting. At this time, the load will be supplied by the inverter. Normally this LED is ON approx. 15 seconds after the inverter is started,

• output LED indicator, this indicator is ON when the load is supplied,

• fault LED indicator, this indicator is ON when there is a failure in the UPS,

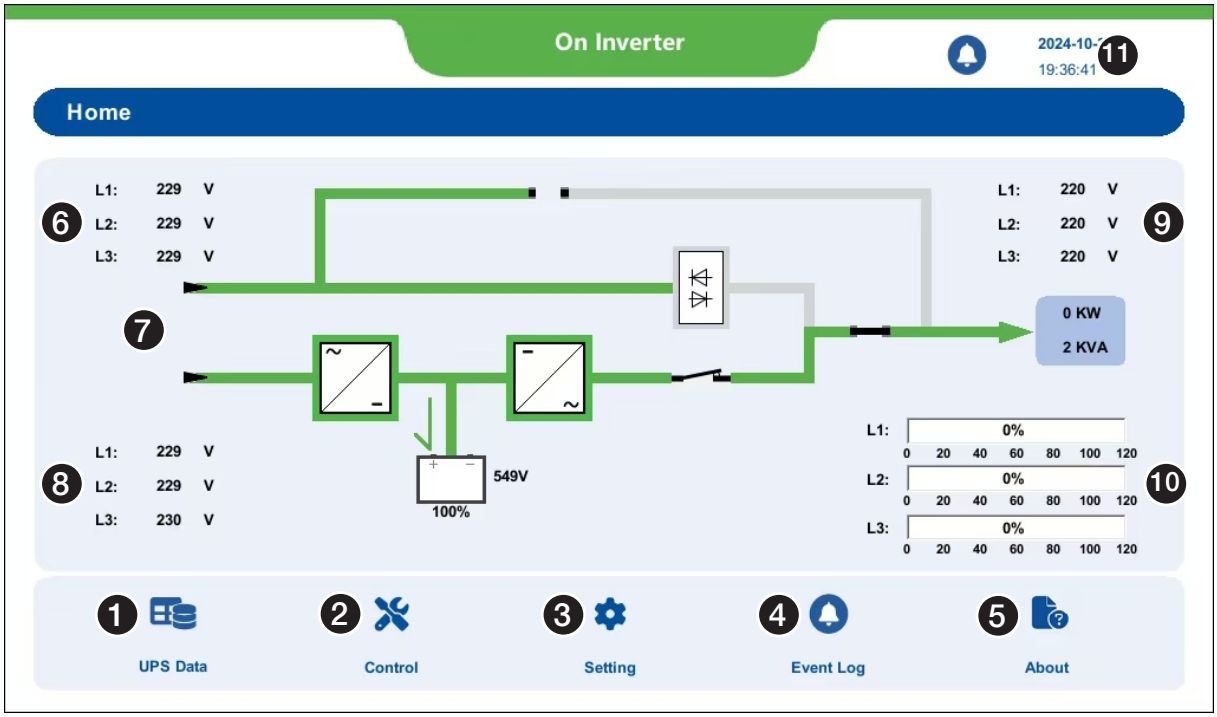
- inverter start key "1", this key is one of the control keys for starting the inverter,
- control combination key "O" is used to start or stop the inverter,
- press the "1" key and "O" key simultaneously to start the inverter,
- press the "O" key and "2" key simultaneously to stop the inverter,
- inverter stop key "2", this key is one of the control keys to stop the inverter.

Control panel with LED status indicator			
Indicator	**Color**	**Status**	**Description**
Standby power supply static switch LED indicator	Yellow	Lights when in bypass mode	Bypass mode
Fault LED indicator	Red	Lights on when there is a fault	Working status has fault
Inverter static switch LED indicator	Green	Lights when inverter mode	Working status, inverter mode
Mains LED indicator	Green	Lights to indicates normal, flashes to indicate abnormal	If the current mains status is normal
Rectifier LED indicator	Green	Lights to indicates normal, flashes to indicate abnormal voltage	Indicate whether the rectifier is working properly, such as when the phase sequence is wrong
Backup LED indicator	Green	Lights to indicates battery mode	In Battery mode
Maintenance bypass LED indicator	Yellow	Lights when maintenance bypass is in use	Maintenance Bypass

8. DISPLAY OPERATION

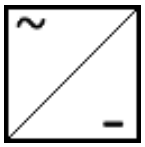
8.1. Display description

Standalone UPS or unit view:



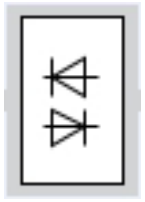
1. Operating parameters
2. System control
3. System settings
4. Event log
5. Help
6. Bypass three-phase voltage display
7. System flow chart
8. Input three-phase voltage display
9. Output three-phase voltage display
10. Load rate display
11. Buzzer

Icon meaning



Rectifier

Inverter



Bypass

Output to load

Battery

Output contactor

8.2. Menu structure

	MENU ITEMS
UPS DATA	
▷ REC1 - REC2	•
▷ INV	•
▷ BAT	•
▷ BYP	•
▷ OUTPUT1 - OUTPUT 2	•
CONTROL	
▷ INVERTER	• (1)
▷ BOOST CHARGING	• (1)
▷ BAT. TEST	• (1)
▷ PARALLEL SYSTEM	^
SETTINGS	
▷ COM.	• (2)
▷ COM1/RS232 - COM2/RS485	
▷ LANGUAGE	•(2)
▷ TIME	•(2)
▷ PASSWORD	•(2)
▷ DRY CONTACT	•(2)
▷ 1# DRY CONTACT	
▷ 2# DRY CONTACT	
▷ 3# DRY CONTACT	
▷ 4# DRY CONTACT	
▷ 5# DRY CONTACT	
▷ 6# DRY CONTACT	
▷ 7# DRY CONTACT	
▷ 8# DRY CONTACT	
▷ ADVANCE	•(3)
▷ REC	
▷ INV	
▷ BATTERY	
▷ INFORMATION	
▷ OFFSET	
▷ COEFFICIENT	
EVENT LOG	
▷ EVENT LOG	•
ABOUT	
▷ HELP1 - HELP 2	•

(1) Depending on settings
(2) User password required
(3) Service password required
(^) Displayed on Parallel configuration

8.3. Alarms management

8.3.1. Alarm report

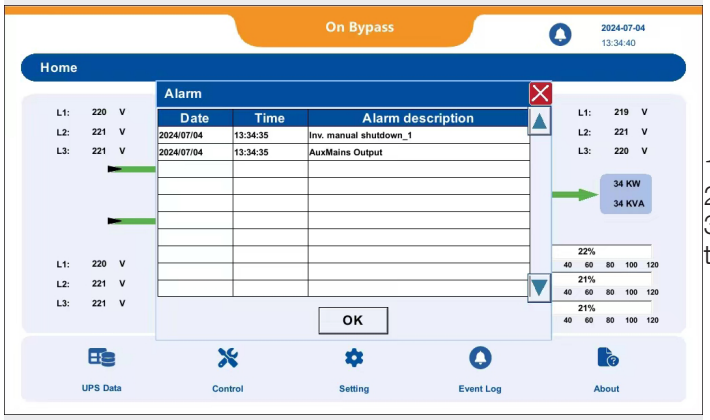
The alarm icon is present if at least one alarm is present.

Tap on the icon to open the alarm list.

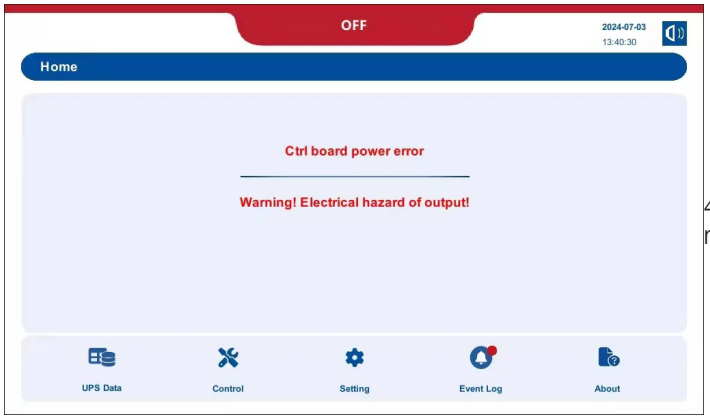
8.3.2. Alarm popup

In case of a critical alarm a popup message appears and the buzzer sounds according to its settings.

The highest priority alarm is displayed.



1. Click OK to close the alarm pop-up window.
2. Tap the buzzer to temporarily disable the buzzer alarm.
3. Click Event log to open past records. The alarm information is arranged according to the event occurrence time.

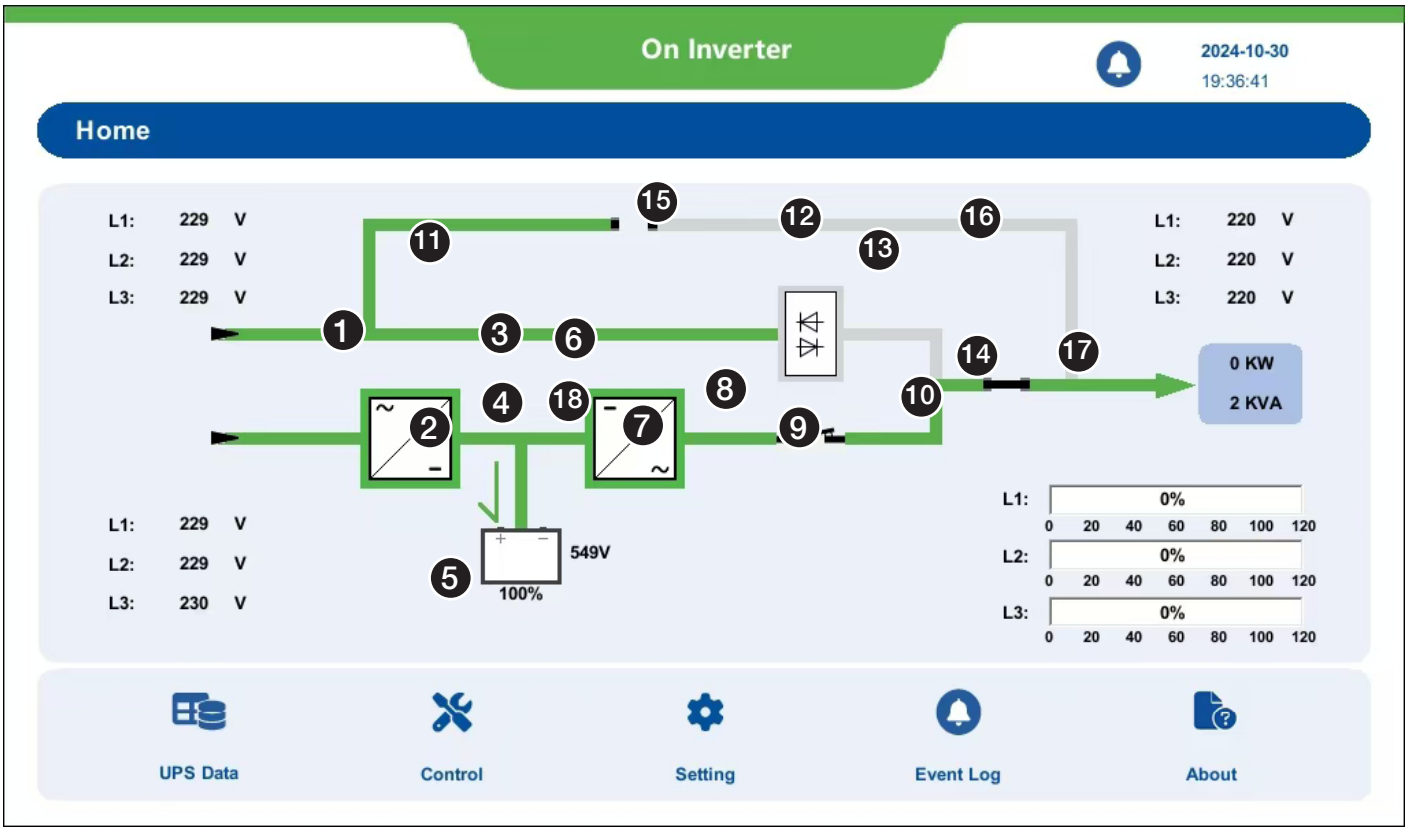


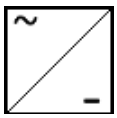
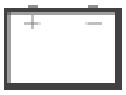
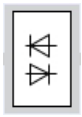
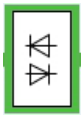
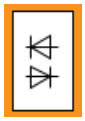
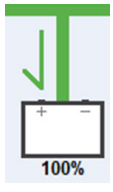
4. If the power supply of the main control board is abnormal, the window pops up automatically.

Tap the OK button to stop the buzzer and to close the popup message. The alarm page is automatically displayed after this action.

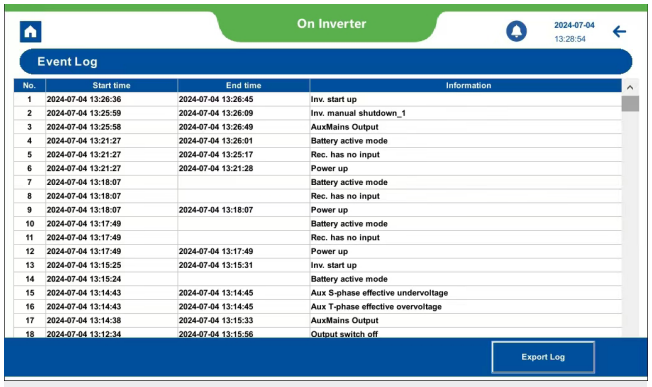
8.4. Synoptic animation

- Standalone UPS or unit view



Item	Description	Rules of animation			Touch actions
		Gray	Green	Yellow	
1	Rectifier input supply	Rectifier input not OK	Rectifier input normal	-	-
2	Rectifier status	Rectifier OFF 	Rectifier ON 	Event/Alarm 	Access to input measurements page
3	DC voltage bus 1	Rectifier OFF	Rectifier ON	-	-
4	Battery voltage bus	Battery not input	Battery input present	-	-
5	Battery status	-	Normal status 	Event/Alarm 	Access to battery measurements page
6	DC voltage bus 2	Rectifier OFF AND Battery Discharge OFF	Rectifier ON OR Battery Discharge ON	-	-
7	Inverter status	Inverter OFF 	Inverter ON 	Event/Alarm 	Access to inverter measurements page
8	Inverter voltage bus	Inverter OFF	Inverter ON	-	-
9	Inverter output status	Inverter not output 	Inverter output 	Event/Alarm	-
10	Inverter voltage bus	Inverter not output	Inverter output	-	-
11	Bypass input supply	Bypass not input	Bypass input present	-	-
12	Bypass output status	Bypass not output 	Bypass output 	Event/Alarm 	Access to bypass measurements page
13	Bypass votage bus	Bypass not output	Bypass output	-	-
14	Output statuts	Output switch open	Output switch closed 	- -	-
15	Maintenance bypass switch status	Switch open	Switch closed 	- -	-
16	Maintenance bypass voltage bus	Maintenance bypass switch open	Load on maintenance bypass	-	-
17	Output voltage bus	Output abnormal	Output normal	-	-
18	Battery charging / discharging	-	Battery charging 	Battery discharging 	-

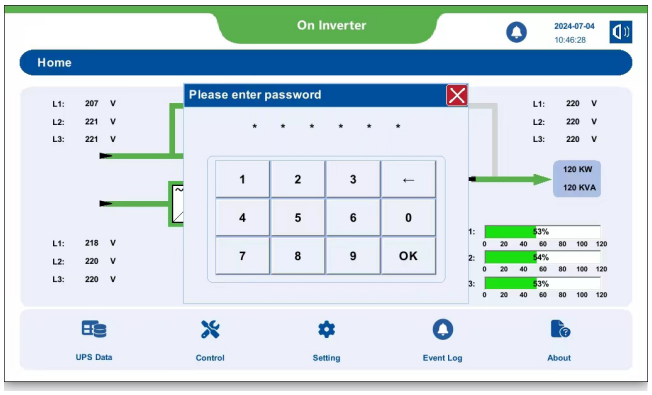
8.5. Event log page



8.6. Menu function descriptions

8.6.1. Entering passwords

Some operations and settings require a password to be performed.



The password is hidden from view by default.

The default password is **000000**.

Press **OK** to confirm the selection or close the window to abort.

8.6.2. CONTROL menu

This menu contains the commands that can be sent to the UPS. If a command is not available, the button is gray.

- Inverter: ON/OFF , see the section 'Operating procedures'.
- Boost charging: Boost On / Boost Off , This control cannot be used when the battery is not connected.
- Bat. test: Start / Stop , This control cannot be used when the battery is not connected.

8.6.3. SETTING menu

- COM. : this function configures the RS232 and RS485 protocol
- Language : sets the language of HMI
- Time : sets the time of HMI
- Password : sets the password
- Dry Contact: configures the dry contact.

9. OPERATING PROCEDURES

	**NOTE!** **Before carrying out any operations on the unit, please read the 'Safety standards' chapter carefully.**
	**NOTE!** **The stop procedure disconnects the load.**

9.1. Switching on

- Switch ON the auxiliary mains switch Q4 and the output switch Q3; the load is now supplied by the auxiliary mains through the static bypass.
- Switch ON Input mains switch Q1.
- Wait for the rectifier to start.
- Starting up the unit on the HMI:
  - Go to **MAIN MENU > CONTROL Menu > Inverter**
  - Select **ON** and press **CONFIRM**.
- Starting up the unit with the power button:
  - Press and hold keys ”1” and “O” simultaneously for 1 second.
    After approx. 4 seconds, the inverter is in a stable operating state.
    After approx. 15 seconds, the UPS goes from static bypass to inverter output mode automatically.
    The UPS is now in "normal operating mode".
- Switch ON the external battery input switch.

	**WARNING!** **Turn ON the external battery input switch only when the rectifier is normal operating mode.**

9.2. Switching off

This operation interrupts the power supply to the load. The UPS and the battery charger will be shut down.

- Turn off the unit on the HMI:
  - Go to **MAIN MENU > CONTROL Menu > Inverter**
  - Select **OFF** and press **CONFIRM**.
- Turn off the unit with the power button:
  - Press and hold keys ”2” and “O” simultaneously for 1 second.
    The Inverter stops immediately and the UPS changes its status from normal mode to bypass mode automatically.
    The Bypass supplies the output.
- Switch OFF the external battery input switch.
- Switch OFF Q1.
- Switch OFF Q4 and Q3.

Wait approx. 15 minutes for the UPS to shut down.

9.3. Bypass operations

Switching to maintenance bypass mode

This operation creates a direct connection between the UPS input and output, excluding the equipment control part. This operation is performed in the event of:

- standard maintenance.
- curative maintenance activity to be done.

	**WARNING! LOAD POWERED BY AUXILIARY MAINS!** **Your load is exposed to mains disturbances.**

- press and hold keys ”2” and “O” simultaneously for 1 second.
- Inverter stops immediately and the UPS changes its status from normal mode to bypass mode automatically. The Bypass supplies the output.
- switch OFF the external battery input switch.
- switch OFF Q1.
- switch ON Q5; the input mains supplies the load through the maintenance bypass .
- switch OFF Q4 and Q3.
- wait approx. 15 minutes for the UPS to shut down.

Switching on from the maintenance bypass

- switch ON the switch Q4 and check the standby power supply static switch LED indicator is ON.
- switch ON the switch Q3.
- switch OFF the switch Q5.

	**NOTE!** **The inverter will not start if the maintenance bypass switch is closed.**

- Switch ON Q1, the rectifier starts running.
- Start the inverter by pressing and holding keys ”1” and “O” simultaneously for 1 second.
- After approx. 4 seconds, the inverter is in a stable operating state. After approx. 15 seconds, the UPS changes its status from static bypass output mode to inverter output mode automatically. The UPS is now in "normal operating mode".
- Switch ON the external battery input switch.

	**WARNING!** **Turn ON the external battery input switch only when the rectifier is in normal operating mode.**

9.4. Extended out of service

If the UPS is deactivated for some time, the batteries must be recharged regularly.

They should be recharged every three months.

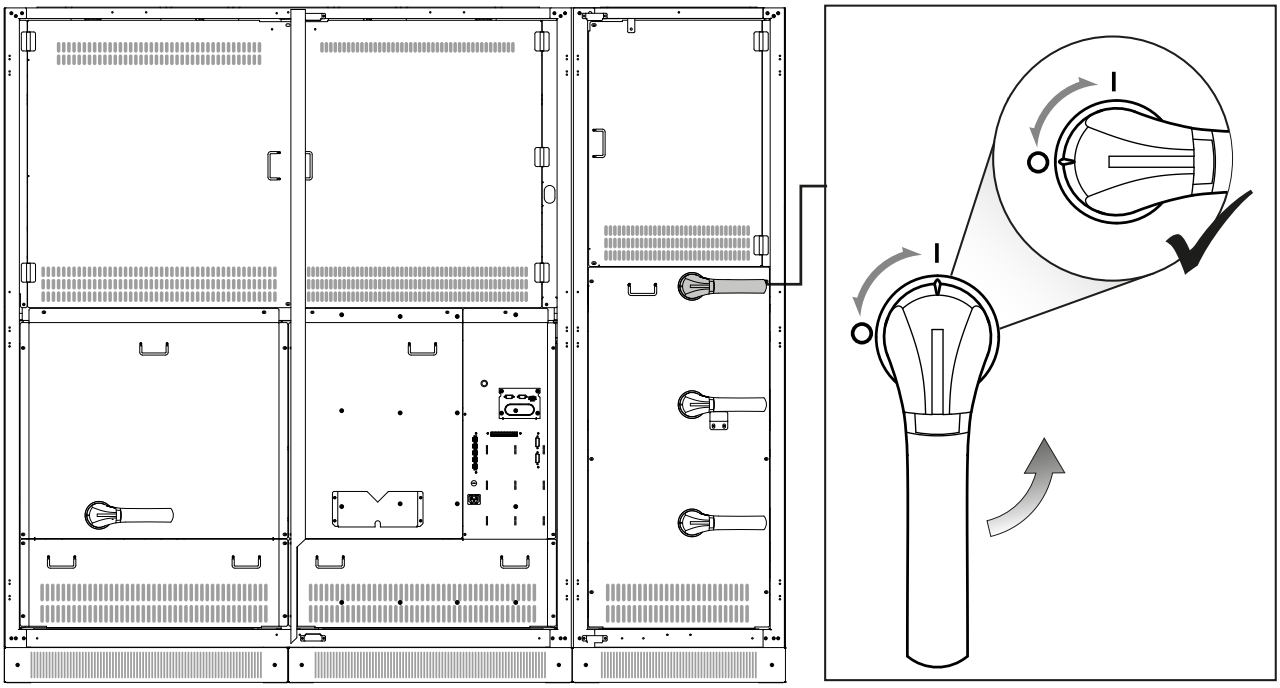
- Check that output switches Q3 and Q5 are OFF.
- connect the mains and auxiliary mains to the UPS.
- switch ON Auxiliary mains switch Q4.
- switch ON input switch Q1.
- wait for the rectifier to go into operation.
- switch ON the external battery input switch. The batttery charger starts.
- wait until the batteries are fully charged. Check this under the menu MAIN MENU > BAT.
- switch OFF the external battery switch.
- switch OFF input switches Q1 and Q4.

9.5. Emergency shutdown

⚠	**NOTE!** **This interrupts the supply to the output load from both inverters and the automatic bypass.**

Emergency power off

- Turn Q3 to position O if you need to interrupt the power supply quickly.



UPS power off (U.P.O.)

You can install a Power OFF button outside the unit to interrupt the UPS in an emergency. Refer to the section 'Standard features and options'.

⚠	**NOTE!** **Use double insulated cables for U.P.O. signals.**
⚠	**NOTE!** **With a parallel-configuration UPS, the UPO signal of each unit should be connected with its own Power OFF button.**

10. OPERATING MODES

10.1. Online mode

A special feature of the UPS is the ONLINE double conversion in conjunction with low distortion mains power absorption. In ONLINE mode, the UPS can supply a voltage that is fully stabilized in frequency and amplitude, regardless of any interference in the mains power supply, within the most stringent classification of UPS regulations.

ONLINE operation provides three operating modes according to mains and load conditions:

1. **Inverter mode**
This is the most frequent operating condition: energy is drawn from the primary mains power supply and converted and used by the inverter to generate the output voltage to power the connected loads.

The inverter is constantly synchronized in frequency with the auxiliary mains to enable load transfer (due to an overload or inverter shutdown) without any break in the power supply to the load.

The battery charger supplies the energy required to maintain or recharge the battery.

2. **Bypass mode**
In the event of inverter failure, the load is automatically transferred onto the auxiliary mains without any interruption in the power supply.

This procedure may occur in the following situations:

- in the event of a temporary overload, the inverter continues to power the load. If the condition persists, the UPS output is switched over the auxiliary mains via automatic bypass. Normal operation, which is from the inverter, returns automatically a few seconds after the overload disappears,
- when the voltage generated by the inverter goes outside the limits due to a major overload or a fault on the inverter,
- when the internal temperature exceeds the maximum permissible value.

3. **Battery mode**
In the event of a mains failure (micro interruptions or extended power cuts), the UPS continues to power the load using the energy stored in the battery.

10.2. High efficiency mode

The UPS has an economy operating mode (ECO MODE) that can increase overall efficiency by up to 99% for energy saving purposes. If the power supply fails, the UPS will automatically switch onto the inverter and continue to supply power to the load by drawing energy from the battery.

This mode does not provide perfect stability in frequency and voltage as in NORMAL MODE. Therefore the use of this mode should be carefully evaluated according to the level of protection required by the application.

ECO MODE provides very high efficiency, since the application is powered directly from the auxiliary mains via the automatic bypass under normal operating conditions.

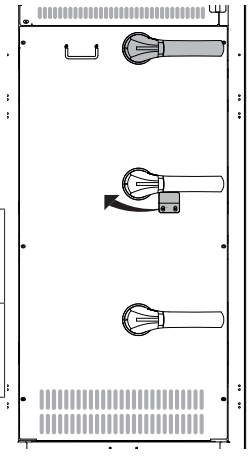
To activate, follow the correct procedure in the control panel.

⚠	**WARNING! LOAD IS POWERED BY THE AUXILIARY MAINS!** **Your load is exposed to mains disturbances.**
⚠	**NOTE!** **The high efficiency mode (ECO mode) is not available for units connected in parallel.**

10.3. Maintenance mode

If the internal maintenance bypass is activated, the load is powered directly from the maintenance bypass, while the UPS is separate from the power supply and can be switched off.
Before moving Q5 to the ON position, remove the blocking protection gear.

This operating mode can be selected for maintenance to be carried out on the system, so that the necessary actions can be performed by service personnel without having to disconnect the power supply to the load.



⚠	**WARNING! LOAD IS POWERED BY THE AUXILIARY MAINS!** **Your load is exposed to mains disturbances.**
⚠	**NOTE!** **When an external manual bypass (1) is present, connect a normally-open early make contact from the External Maintenance bypass switch to the dedicated connector.**

(1) If a normally-closed early make contact is not available, the external manual bypass must be open just before opening Q5.

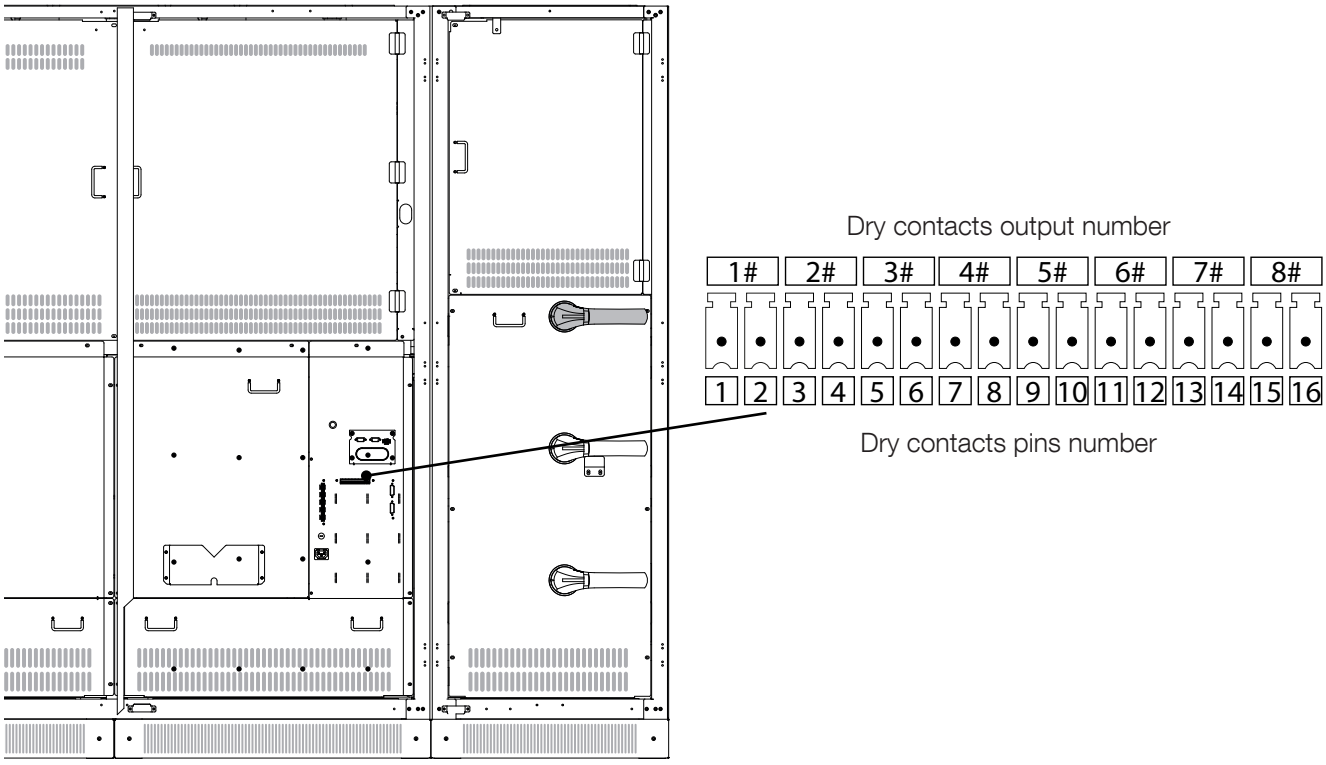
11. STANDARD FEATURES AND OPTIONS

Availability	
●	Factory-installed option
○	Available as option
-	Not available
STD	Standard feature

Features		Compatibility
Interfaces		
Dry contact	STD	
Input signals interface (201BN)	STD	
Modbus RTU (RS232)	STD	
Communication option		
Net Vision Box	○	
EMD	○	⚠ ❗ Net Vision Box
Mechanical option		
Kit for IP31	○	
PEN Kit	○	
Battery Temperature sensor	○	

❗ Required option

11.1. Dry contacts interface



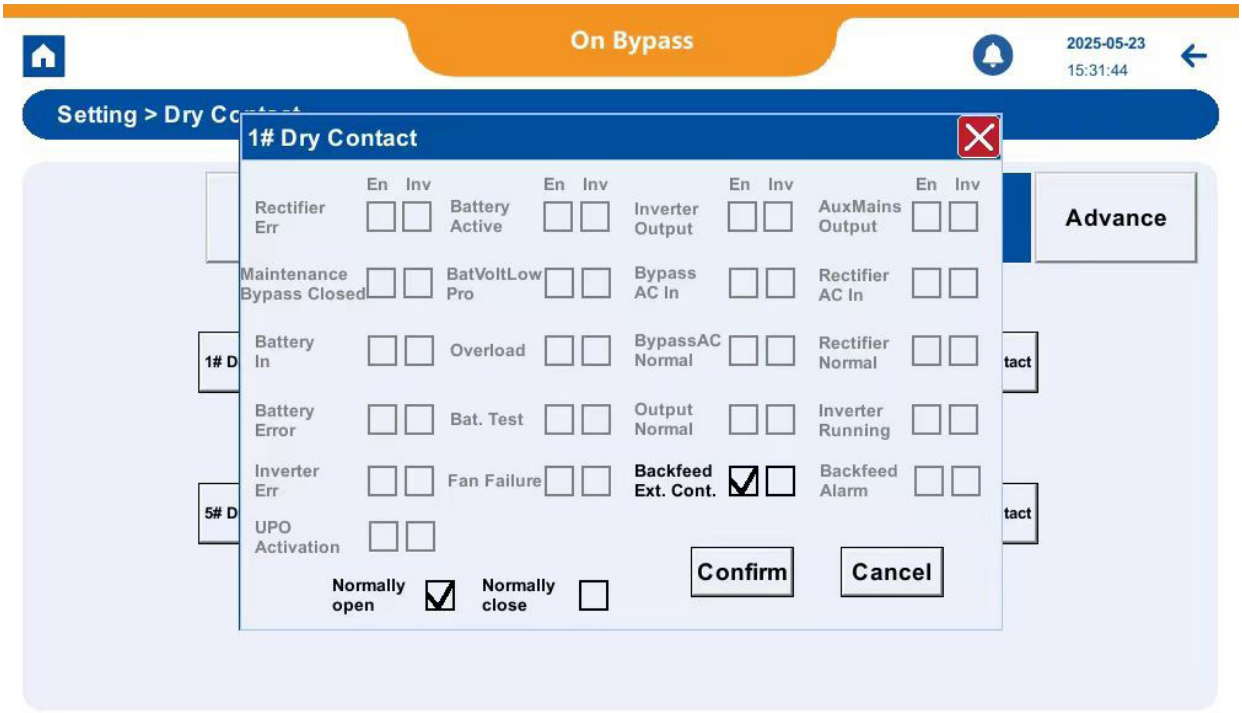
1. Functionality and settings

The Dry Contact interface provides 8 relays for external devices activation (can be set as “effective close” or “effective break”). The rated relay contacts voltage is 250 V (AC) / 30 V (DC) with 5 A maximum current.

It’s possible to configure the dry contacts on the HMI:

MAIN MENU --> SYSTEM SETTINGS (Password needed) --> DRY CONTACT

and choose the relative dry contact number.



The image above shows a specific configuration setting for dry contact number 1, to activate the backfeed protection function.

When “EN” (enable) for the “Backfeed Ext. Cont.” (status event) is selected and “Normally Open” enabled, dry contact number 1 changes from open to closed to control the external backfeed protection device in compliance with the backfeed protection logic. It’s possible to select “INV” to reverse the logic.

When multiple status bits are selected, the result will be the OR relationship.

Dry contact logic table:

EN	INV	Normally open	Normally close	STATUS EVENT	Contacts state
1	0	0	1	From 0 to 1	From closed to open
1	0	1	0	From 0 to 1	From open to closed
1	1	1	0	From 0 to 1	From closed to open
1	1	0	1	From 0 to 1	From open to closed
0	x	x	x	x	No change

NOTE!
EN must be selected to enable the relative dry contact.

2. Configuration description

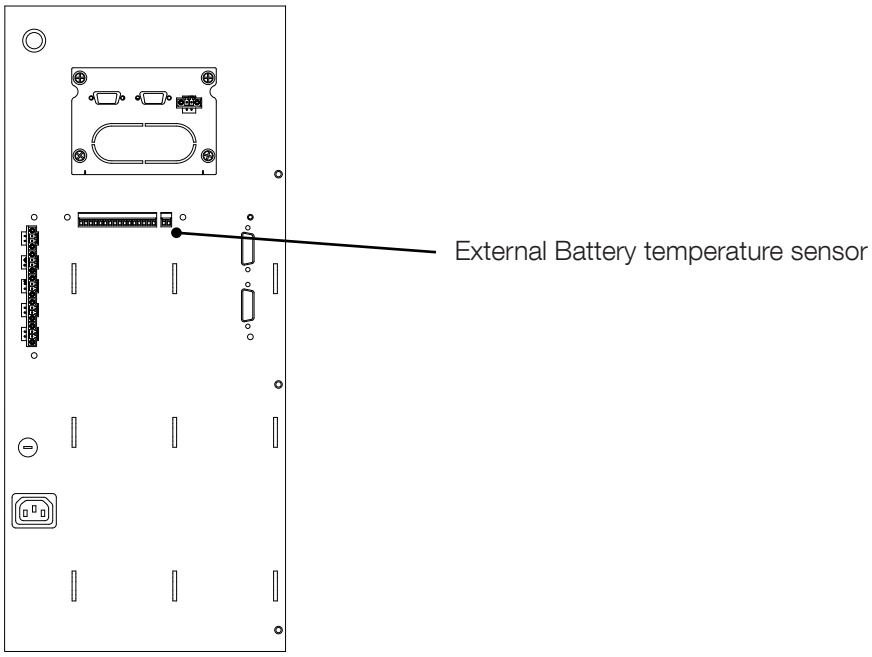
Status event	Description
Rectifier Err	Active when the rectifier is not OK
Battery Active	Active when the battery is discharging
Inverter Output	Active when the load is supplied by the inverter, output voltage is OK
AuxMains Output	Active when the load is supplied by bypass, output voltage is OK
Maintenance bypass closed	Active when maintenance bypass switch is ON.
BatVoltLow Pro	Active when battery undervoltage alarm is present
Bypass AC in	Active when the input auxiliary line voltage is present
Rectifier AC In	Active when input mains line voltage is present
Battery In	Active when the battery input voltage is present
Overload	Active when there is an output overload
Bypass AC Normal	Active when the auxiliary input is OK
Rectifier Normal	Active when the input mains is OK
Battery Error	Active when the battery is not OK
Bat. Test	Active during a battery discharge test
Output Normal	Active when UPS output voltage is OK
Inverter Running	Active when the inverter is ON
Inverter Err	Active when the inverter is not OK
Fan failure	Active when there is a fan fault
Backfeed Ext. Cont.	Active to open the external backfeed contactor
Backfeed Alarm	Active when there is a backfeed alarm

3. Factory default setting

TERMINAL PIN	DRY CONTACT	FUNCTION	CONTACT STATE
1-2	1#	None function assigned	Normally open
3-4	2#	Battery Active	Normally open
5-6	3#	AuxMains Output	Normally open
7-8	4#	Bypass AC In(INV) ***OR*** Rectifier AC In(Inv) ***OR*** Battery In(Inv)	Normally open
9-10	5#	Overload	Normally open
11-12	6#	Battery Error	Normally open
13-14	7#	Inverter Err ***OR*** Maintenance bypass closed	Normally open
15-16	8#	Rectifier Err ***OR*** Battery Active ***OR*** Maintenance bypass closed ***OR*** Bypass AC IN(Inv) ***OR*** Rectifier AC In(Inv) ***OR*** Battery In(Inv) ***OR*** Overload ***OR*** Battery Error ***OR*** Inverter Err	Normally open

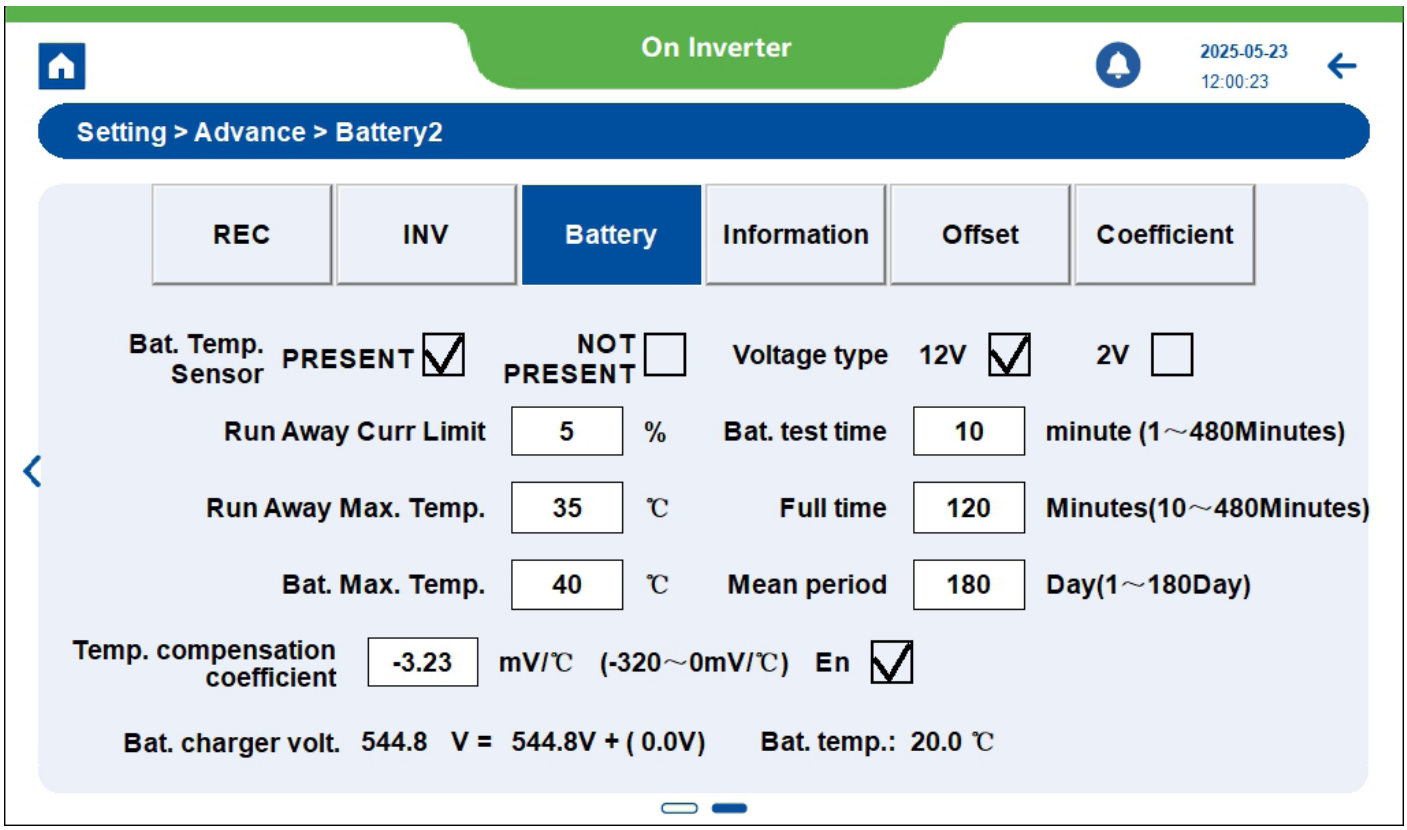
4. External battery temperature sensor

In order to maximize the batteries lifetime by assuring that they're reciving the proper recharge setpoints in all weather conditions, a temperature compensation function is available using an external optional sensor.



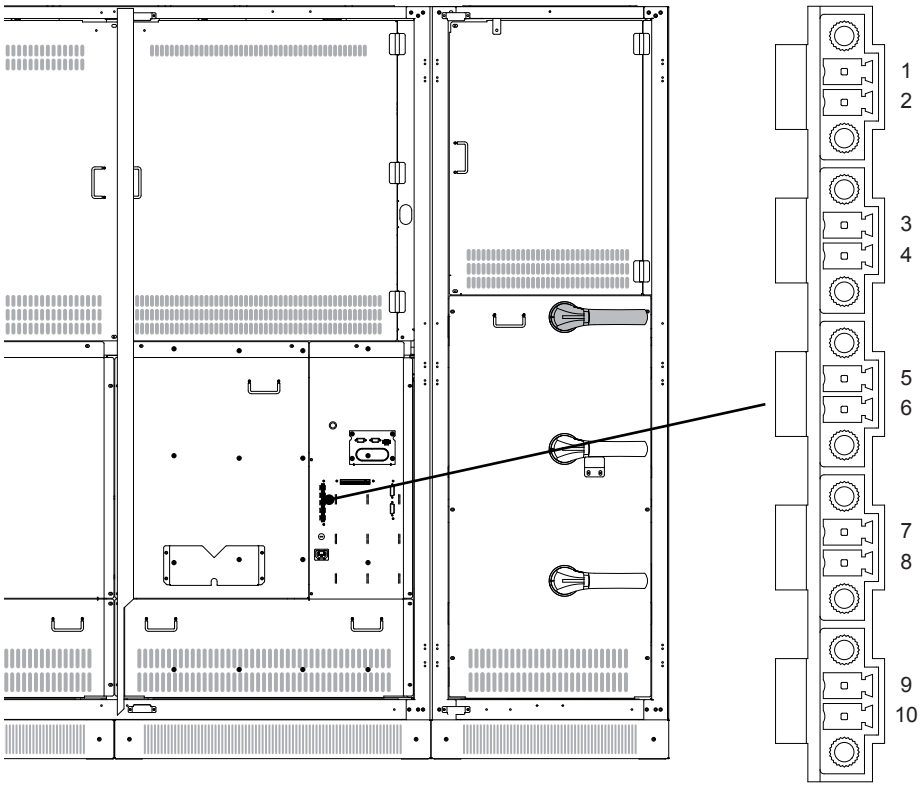
It's possible to configure and enable the battery temperature compensation function on the HMI by service people.

MAIN MENU > SETTING (Service password needed) > Battery2



11.2. Input signals interface (201BN)

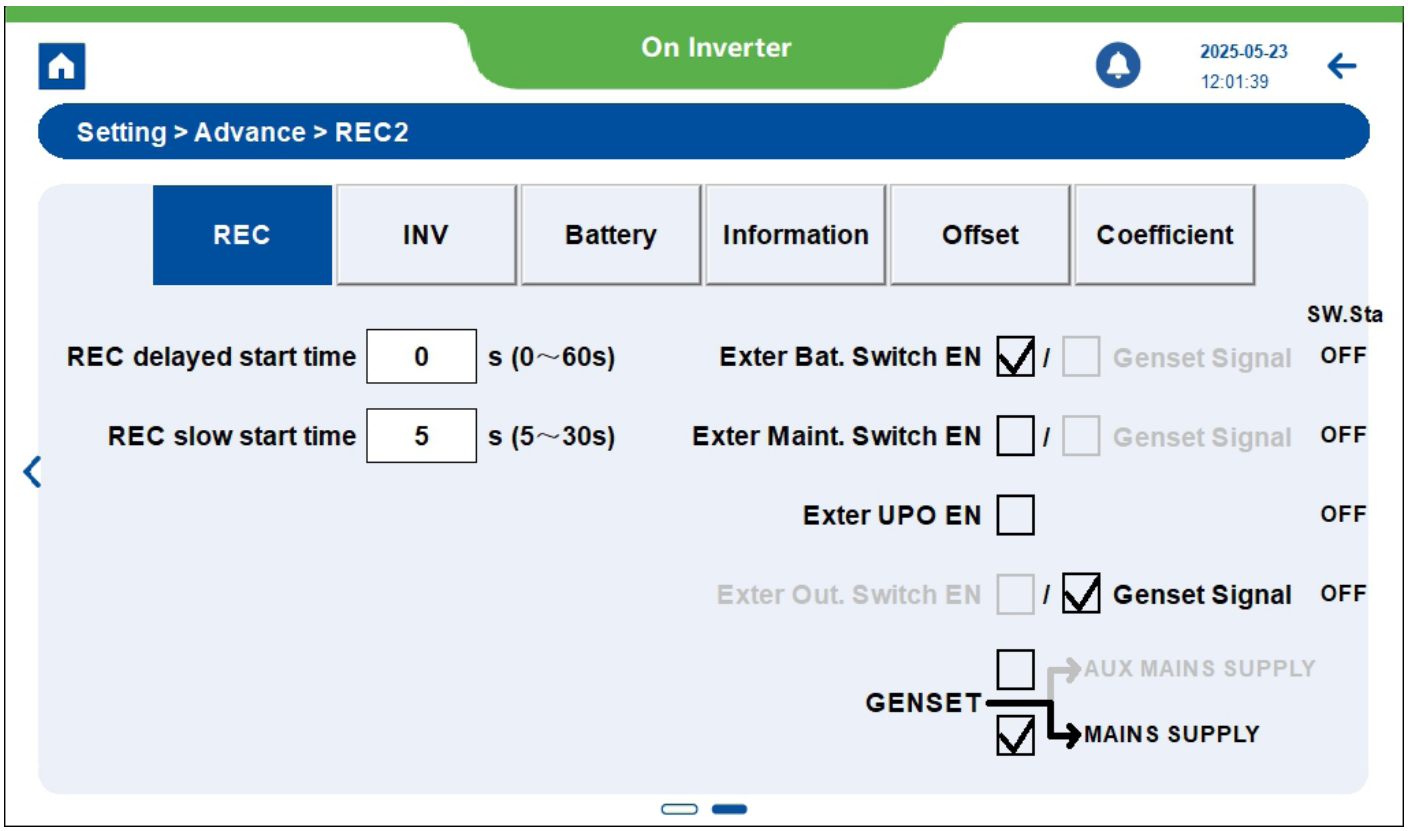
201BN interface



Terminal number	Description	Default status
1-2	External bypass backfeed contactor	Normally closed
3-4	External battery switch / GENSET	Normally open
5-6	External maintenance bypass switch / GENSET	Normally open
7-8	External UPS Power off button (U.P.O)	Normally closed
9-10	External output switch / GENSET	Normally open

It's possible to activate the GENSET function on the HMI by service people.

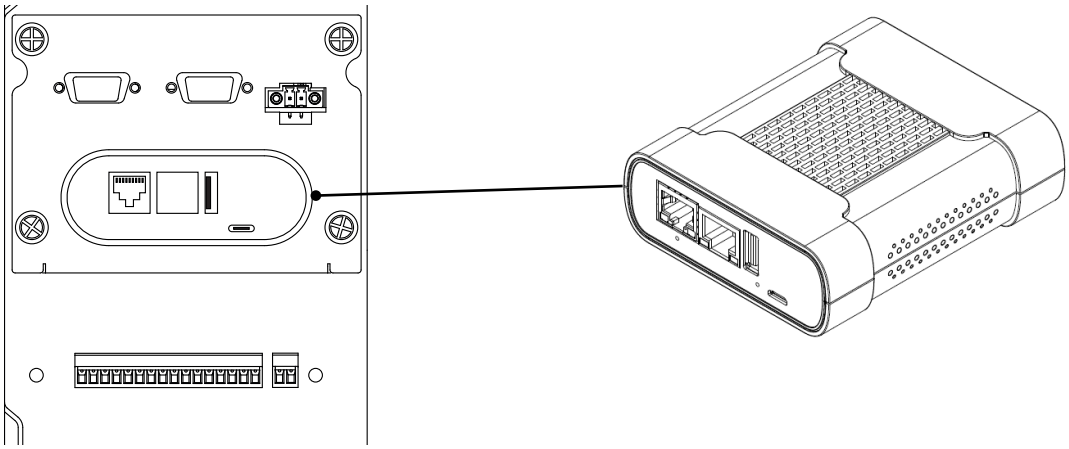
MAIN MENU > SETTING (Service password needed) > Advance > REC2.



11.3. Net Vision Box

NET VISION is a communication and management interface designed for business networks. The UPS behaves exactly like a networked peripheral, it can be managed remotely, and allows the shutdown of network workstations.

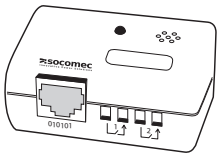
NET VISION allows a direct interface between the UPS and LAN network avoiding dependence on the server and support SMTP, SNMP, DHCP and many other protocols. It interacts via the web browser.



11.3.1. EMD

EMD (Environmental Monitoring Device) is a device to be used in conjunction with the NET VISION interface and provides the following features:

- temperature and humidity measurements + dry contact inputs,
- alarm thresholds configurable via Web browser,
- notification of environmental alarm via email and SNMP traps.

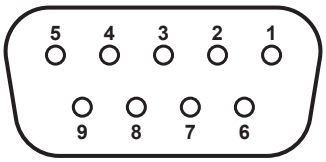


11.4. MODBUS RTU serial link

The RS232/RS485 interfaces provide MODBUS RTU protocol.

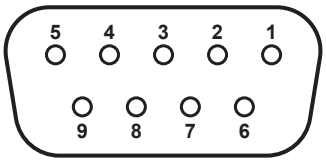
See the relative manual for the UPS addresses description. Contact Socomec for detailed information.

COM1: RS232



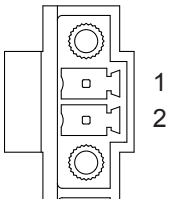
1.	-	4.	-	7.	-
2.	RS232-TX	5.	GND	8.	-
3.	RS232-RX	6.	-	9.	-

COM2: RS485



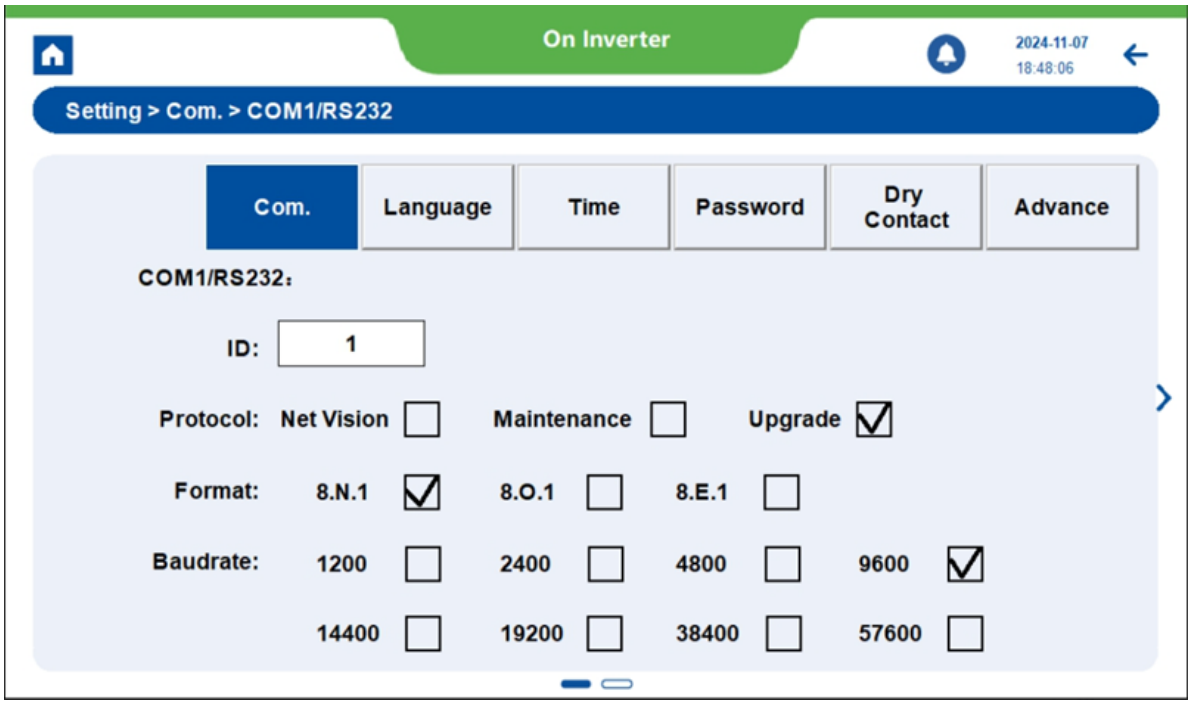
1.	-	4.	RS485-A	7.	-
2.	-	5.	-	8.	-
3.	-	6.	RS485-B	9.	-

COM2: RS485

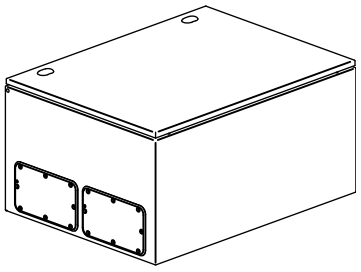


1.	RS485-A				
2.	RS485-B				

It’s possible to configure the serial link by HMI: MAIN MENU -> SETTING (user password needed) -> COM and enable Net Vision for the Socomec address mapping.



11.5. Black start

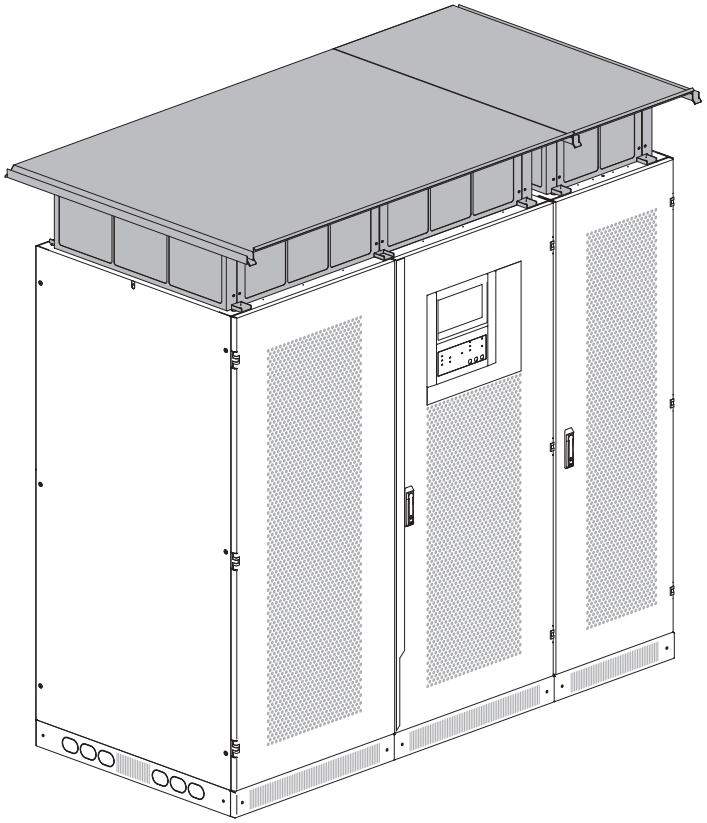


The Black start option aim is to turn on the UPS form a totally off condition having only batteries connected without input mains present.

The Black start option has to be installed between the UPS and the batteries.

See the option instruction manual for the details.

11.6. Kit for IP31



12. TROUBLESHOOTING

The alarm messages displayed let you preform an immediate diagnosis.

For other alarms that may appear, please contact the Service Dept.

12.1. System alarms

No Rec. In.	Rectifier has no input
Rec. In. phase loss	Input voltage lacks phase
Rec. Phase rotation fault	Input phase sequence error
Rec. In. Fr. out of tol.	Input frequency abnormal
Rec. In. L1 overvoltage	L1-phase input overvoltage
Rec. In. L2 overvoltage	L2-phase input overvoltage
Rec. In. L3 overvoltage	L3-phase input overvoltage
Rec. In. L1 undervoltage	L1-phase input undervoltage
Rec. In. L2 undervoltage	L2-phase input undervoltage
Rec. In. L3 undervoltage	L3-phase input undervoltage
Rec. In. L1 overcurrent	L1-phase input overcurrent
Rec. In. L2 overcurrent	L2-phase input overcurrent
Rec. In. L3 overcurrent	L3-phase input overcurrent
Rec. abnormal	Rectifier comprehensive alarm
Rec. lock failed	Rectifier lock failed
Rec. DC bus overvoltage	Rectifier bus overvoltage
Rec. DC bus undervoltage	Rectifier bus undervoltage
Rec. overtemperature protection	Rectifier overtemperature protection
Rec. hardware soft start timeout	Rectifier hardware soft start timeout
Rec. software soft start timeout	Rectifier software soft start timeout
Rec. inductance overtemperature protection	Rectifier input inductance overtemperature
Rec. hardware failed to recover	Rectifier hardware failed to recover
Rec. overtemperature alarm	Rectifier overtemperature alarm
Rec. inductance current sampling is abnormal	Rectifier inductive current sampling is abnormal
Battery disconnected	Battery no input
Bat. undervoltage protection	Battery undervoltage protection
Bat. overvoltage protection	Battery overvoltage protection
Bat. charging overcurrent protection	Battery charging overcurrent protection
Bat. discharging overcurrent protection	Battery discharging overcurrent protection
Bat. inductance overtemperature	Battery inductance overtemperature protection
Bat. failed to recover	Battery failed to recover
Bat. overvoltage alarm	Battery overvoltage alarm
Bat. undervoltage alarm	Battery undervoltage alarm
Bat. hardware soft start timeout	Battery hardware soft start timeout
Bat. software soft start timeout	Battery software soft start timeout
Boost Charger ON	Battery boost symbol
Enter BAT test mode	Battery test symbol
No Bypass In.	Bypass has no input
Byp. abnormal	Bypass comprehensive alarm
Byp. In. phase loss	Bypass lacks phase
Byp. phase rotation fault	Bypass phase sequence fault
Byp. In. Frequency not OK	Bypass frequency abnormal
Byp. In. L1 overvoltage	Bypass L1 phase effective value phase overvoltage
Byp. In. L2 overvoltage	Bypass L2 phase effective value phase overvoltage
Byp. In. L3 overvoltage	Bypass L3 phase effective value phase overvoltage

Byp. In. L1 undervoltage	Bypass L1 phase effective value phase undervoltage
Byp. In. L2 undervoltage	Bypass L2 phase effective value phase undervoltage
Byp. In. L3 undervoltage	Bypass L3 phase effective value phase undervoltage
Bypass overload protection	Bypass output overload protection
Bypass SCR temp. Alarm	Bypass SCR overtemperature protection
Inv. L1 transient overcurrent	Inverter L1-phase transient overcurrent
Inv. L2 transient overcurrent	Inverter L2-phase transient overcurrent
Inv. L3 transient overcurrent	Inverter L3-phase transient overcurrent
Inv. L1 transient overvoltage	Inverter L1-phase transient overvoltage
Inv. L2 transient overvoltage	Inverter L2-phase transient overvoltage
Inv. L3 transient overvoltage	Inverter L3-phase transient overvoltage
Inv. L1 effective value overvoltage	Inverter L1-phase effective value overvoltage
Inv. L2 effective value overvoltage	Inverter L2-phase effective value overvoltage
Ctrl board power error!	Motherboard power supply abnormal
Output switch is not closed	Need to close the parallel-units mode output switch
Inv. start up	Manually start the inverter
Inv. manual shutdown_1	Inverter manually shutdown via HMI
Byp. inductance overtemperature	Bypass inductance overtemperature
Byp backfeed fault	Bypass Backfeed Error
Output L1 overcurrent	L1-phase output overcurrent
Output L2 overcurrent	L2-phase output overcurrent
Output L3 overcurrent	L3-phase output overcurrent
Output short circuit fault!	Output short circuit fault
Inv. transformer overtem.	Output transformer overtemperature protection
Inv. output overload protection	Inverter output overload protection
Single mode error	Single-unit mode error
Parallel communication fault	Communication abnormalities among multiple devices in a parallel-units system at the same time
Insufficient resources	Insufficient number of parallel power extension units
Inverter redundancy lost	Insufficient number of parallel redundant units
Reduncancy lost	Parallel-units system power overload
FPGA start-up failed	FPGA start-up failed
Load supply by Maintenance Bypass	Maintenance bypass output
Fan Failure	Fan fault
Output switch off	Output breaker is open
Output abnormal	UPS output abnormal
L1 overload 101%-110%	L1-phase output overload 101%-110%
L1 overload 111%-125%	L1-phase output overload 111%-125%
L1 overload 126%-150%	L1-phase output overload 126%-150%
L1 overload 151%-200%	L1-phase output overload 151%-200%
L1 overload >201%	L1-phase output overload > 201%
L2 overload 101%-110%	L2-phase output overload 101%-110%
L2 overload 111%-125%	L2-phase output overload 111%-125%
L2 overload 126%-150%	L2-phase output overload 126%-150%
L2 overload 151%-200%	L2-phase output overload 151%-200%
L2 overload >201%	L2-phase output overload > 201%
L3 overload 101%-110%	L3-phase output overload 101%-110%
L3 overload 111%-125%	L3-phase output overload 111%-125%
L3 overload 126%-150%	L3-phase output overload 126%-150%
L3 overload 151%-200%	L3-phase output overload 151%-200%
L3 overload >201%	L3-phase output overload > 201%
Inv. L3 effective value overvoltage	Inverter T-phase effective value overvoltage
Inv. L1 effective value undervoltage	Inverter R-phase effective value undervoltage
Inv. L2 effective value undervoltage	Inverter S-phase effective value undervoltage
Inv. L3 effective value undervoltage	Inverter T-phase effective value undervoltage

Inv. overtemperature protection	Inverter overtemperature protection
Inv. overtemperature alarm	Inverter overtemperature alarm
Inv. start-up failed	Inverter start-up failed
Inv. lock failed	Inverter lock failed
Inv. inductance current sampling is abnormal	Inverter inductance current sampling is abnormal
Inv. manual shutdown_2	Inverter manually shutdown via pressing the botton
Inv. manual shutdown_3	Inverter manually shutdown via CAN
Inverter contactor OFF	Inverter contactor fails to close
Inv. abnormal	Inverter comprehensive alarm
Inv. Comp. output	Inverter compensation output under ECO mode
Bypass Output	Bypass Output
Byp. L1 transient undervoltage	Bypass R-phase transient undervoltage
Byp. L2 transient undervoltage	Bypass S-phase transient undervoltage
Byp. L3 transient undervoltage	Bypass T-phase transient undervoltage
Byp. L1 transient overvoltage	Bypass R-phase transient overvoltage
Byp. L2 transient overvoltage	Bypass S-phase transient overvoltage
Byp. L3 transient overvoltage	Bypass T-phase transient overvoltage
Force load on when byp in. is under voltage	Force load on when bypass input is under voltage
Byp. external switch is opening	Bypass external switch is opening
In battery mode	UPS in battery mode
Battery charger failure	Battery charger failure
Parallel ID abnormal	Parallel ID abnormal
Parallel voltage error	Parallel voltage difference error
Parallel current error	Parallel current unbalacing error
Parallel synchronizing phase-locked err	Parallel synchronizing phase-locked error
Parallel synchronizing signal abnormal	Parallel synchronizing signal abnormal
Power up	Power up
Test mode	UPS in Test mode
IGBT drive power is abnormal	IGBT drive power is abnormal
IMMINENT STOP	UPS is about to shutdown
Bat. temperature sampling is abnormal	Battery temperature sampling exceeds the limit or abnormal
External battery switch off	External battery switch off
Remote UPO signal activation	Remote UPO signal activation
External maintenance bypass ON	External maintenance bypass ON
External output switch off	External output switch off
Bat. Fuse is abnormal	Battery Fuse is abnormal
Battery Temperature Alarm	Battery Temperature exceeds overtemperature alarm threshold
Bat. overtemperature protection	Battery Temperature exceeds overtemperature protection threshold
Genset activate	Genset activate
Rec. GENSET MODE	Rectifier GENSET MODE
Byp. GENSET MODE	Bypass GENSET MODE
Byp. voltage sampling abnormality	Bypass voltage sampling abnormality
Bat. charging timeout	Battery charging time exceeds the set value
Float charging ON	Battery Float charging ON

13. PREVENTIVE MAINTENANCE

	**NOTE!** **Before carrying out any operations on the unit, please read the section 'Safety standards' carefully.**
	**NOTE!** **Any work carried out on the equipment must be performed by qualified technicians authorized by SOCOMEC.**

Routine maintenance carried out annually is recommended in order to provide optimum operating efficiency and avoid equipment downtime.

Maintenance consists of thorough functionality checks on:

- electronic and mechanical parts,
- dust removal,
- battery inspection,
- software updating,
- environmental checks.

13.1. Fans and capacitors

The lifespan of consumable parts such as fans and capacitors (AC and DC) depends on whether or not the use and environmental conditions (premises, usage or load type) are abnormal or harsh for the equipment.

We recommend replacing consumables as follows(1):

Consumable part	Years
Fan	4
AC and DC capacitor	5

(1) Based on operation of the unit according to the manufacturer's specification.

14. SAFEGUARDING THE ENVIRONMENT

Do not dispose of electrical appliances with normal waste, use separate collection facilities.

Follow local council waste regulations for proper disposal arrangements to reduce the environmental impact of waste electrical and electronic equipment, or contact your local government for information regarding the collection arrangements available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging health and wellbeing. Depleted batteries are considered as toxic waste. When the battery needs replacing, only give rundown batteries to certified and licensed waste disposal companies. In accordance with local legislation, it is prohibited to dispose of batteries together with other industrial waste or household refuse.

The crossed-out trash bin symbol is placed on this product to encourage users to recycle components and units whenever possible. Please be environmentally responsible and recycle this product through your recycling facility at the end of its lifetime.

For any questions regarding the disposal of the product, contact local distributors or retailers.

15. TECHNICAL SPECIFICATIONS

Power (kVA)			500	600
Input				
Input mains voltage			400 V (-15%/+15%)	
Input mains frequency		Hz	50/60 ±10%	
Input power factor			≥ 0.99[1]	
Total harmonic input current distortion (THDi)			≤ 3% (at: Pn, Resistive load, Mains THDv ≤ 1%)	
Output				
Output voltage (three phase + neutral)		V	3Ph+N+PE 380/400/415 V ±1%	
Frequency		Hz	50/60 Hz ±5%	
Total output voltage distortion (THDv)		%	<=1% (resistive load)) <=5% (non-linear load)	
Overload[2]	10 min	kW	562.5	675
	1 min	kW	675	810
Crest Factor			≥ 3	
Bypass				
Bypass input voltage		V	3Ph+N+PE 380 V (-20%/+20%) 400 V (-20%/+15%) 415 V (-20%/+10%)	
Bypass input frequency		Hz	50/60 +/-5% selectable	
Stored energy mode of operation				
Battery voltage range		V	420V - 560 VDC	
Environmental				
Operating temperature		°C	0 °C to 35 °C	
Storage temperature		°C	–25 °C to +55 °C	
Relative humidity		%	95% condensation-free	
Altitude (max)		m	1000 (3000 with derating)	
Acoustic noise[3] (at 70% Pn)		dBA	76.5	76.5
Cooling type			Air from bottom to top	
Required cooling capacity		m^3/h	10704	10704
Dissipated power (max)		W	27400	41300
Dissipated power (max)		BTU/h	93500	141000
Dimensions and weight				
Dimensions (W x D x H)		mm	2200 x 1000 x 1900	
Weight		kg	2800	3000
Standard				
Safety			EN/IEC 62040-1	
EMC			EN/IEC 62040-2	
Product certification			IECEE CB Scheme IEC 62040-1	
Product marks			CE	
Protective class			Protective Class I	
Protection level			IP20 version - IP31 version	

(1) Pout ≥ 75% Sn

(2) Initial Condition Pout ≤ 80% Pn

(3) A-weighted surface time-averaged sound pressure level

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